IDG.net

UNTAPPED WORKFORCE

American Indians need work. IT needs workers. Can the two get together? Page 48

BOOM AND BUST

Some Emerging Companies we profiled became fabulous wins. Others, well . . . Here's the rundown for 1999. Page 58

MERGER LESSONS '99

It's been another huge year for mergers – and IT has been left to pick up the pieces. Page 20

COMPUTERWORLD

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FEDS SEEK IT HELP ON NET SECURITY

Users fear privacy loss, government regulation

BY PATRICK THIBODEAU

Federal officials are trying to create an information security partnership with key private companies for sharing electronic attack information and best practices. Security managers see benefits but also worry that government cooperation may have unwanted consequences.

With so much of the nation's vital services — from telecommunications to energy — in private hands, government officials say they can't improve national security without private cooperation. They also warn that cyberattacks on private companies could cripple part of the nation's infrastructure. The move is part of a plan President Clinton unveiled in 1998 to make infrastructure protection a high priority.

U.S. Department of Commerce officials held a closed-door meeting in New York earlier this month with officials from about 75 companies, representing transportation, finance, energy and telecommunications, to persuade them to work with the government.

The government said it will also help companies by offering incentives to students to pursue careers in technical areas as well as funding for security-related research and development projects. Many

Security, page 77

IT CAN REDUCE MEDICAL ERRORS

Push follows U.S. report on fatal drug mistakes

BY JULEKHA DASH

A federal effort to wring medical errors out of the U.S. health care system may speed up some slow-moving information technology initiatives that could prevent dangerous drug mix-ups.

On Dec. 6, President Clinton ordered federal agencies that finance or provide health care to take steps to reduce medical errors. In his briefing, Clinton mentioned that technology could be part of the solution.

The pronouncement came shortly after a report from the Institute of Medicine — a research arm of the prestigious National Academy of Sciences in Washington — revealed that 44,000 to 98,000 Americans die each year from preventable errors, such as prescription mistakes.

Though Clinton's statement was directed at the government-financed segment of health care, it will likely spur action throughout the industry, said Arnold Milstein, a consultant at New York-based William M. Mercer Inc.

For instance, Milstein heads a task force that is urging hos-

Medical Errors, page 77

EDWARD SANTALONE

"I WOULD TAKE THIS as a terrible defeat if we didn't succeed [with our Y2K preparations]," says Edward Goldberg, executive vice president of operations services at Merrill Lynch. He'll be monitoring Y2K action from the company's primary command center in New York

YEAR 2000 CHRONICLES

CHAPTER 7

THE SOFTWARE HAS BEEN TESTED, THE INDUSTRY trials are over. Contingency plans — ranging from lists of who knows CPR to what to do in case of a riot — are ready in big binders. Command centers are monitoring CNN and foreign offices. IT staffers have set up cots for sleeping between 12-hour shifts. That's the scene at the six companies *Computerworld* has followed in this series, as they burned through a total of $801 million for Y2K repairs. Now they wait for the new year to dawn in New Zealand and other spots around the globe — to see if it all works. *Report begins on page 42.*

COMPUTERWORLD Y2K WATCH

JOIN THE COUNTDOWN to the millennium rollover and track the aftermath! Starting next Monday, go to our Y2K Watch home page (*www.computerworld.com/y2kwatch*) for global reports, a year 2000 forum, QuickPolls, legal and post-Jan. 1 advice, links to our archived Y2K stories and resources, day-after commentary and scads of Y2K facts and trivia.

Questions? Tips? Contact us via our Y2K mailbox at *y2kwatch@computerworld.com.*

More Inside

- An eleventh-hour checklist to help you cover things you may have overlooked. **Page 46**
- Our Y2K confidence survey shows that 97% of IT managers say they're ready. **Page 36**
- Don't assume that just because Y2K is here you're finished with it, Ed Yourdon warns. **Page 39**

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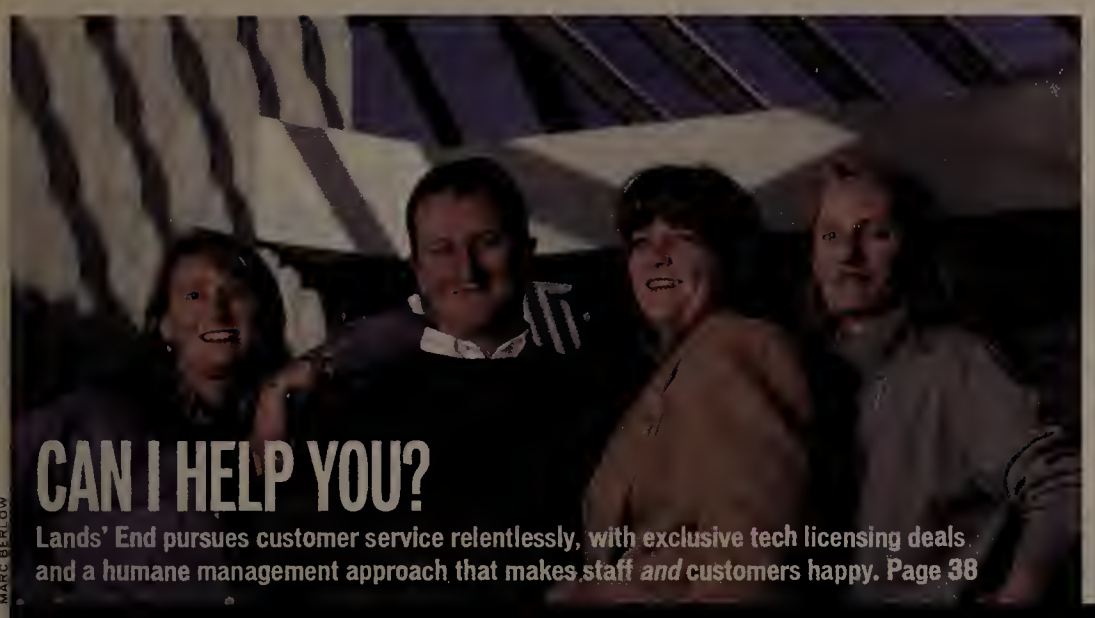

MARC BERLOW

CAN I HELP YOU?

Lands' End pursues customer service relentlessly, with exclusive tech licensing deals and a humane management approach that makes staff *and* customers happy. Page 38

Y2K – FORGET ANYTHING?

Cell phones, pencils, contact numbers for staff? A checklist will help you make sure you cover last-minute gaps. Page 46

GINA TRIPLETT

COMPUTERWORLD THIS WEEK

DECEMBER 20, 1999

NEWS 4

4 VENDORS RACE to offer retailers full cost of overseas shipping, but the technology isn't proven.

8 DIGITAL CERTIFICATES set to expire New Year's Day could cause headaches.

10 WIRELESS APP PROTOCOL builds momentum, but enterprise adoption is a ways off.

12 AMR SPINS OFF SABRE, freeing the company to sell its reservation software and services to airline competitors.

14 NOVELL ATTEMPTS to increase market share with new version of NetWare, but its efforts aren't enough.

16 SAP KICKS OFF the new year with a sales force reorganization and new software packaging and pricing.

20 ANALYSTS WARN that companies have learned few, if any, lessons from recent mergers.

21 REPORT PREDICTS few Y2K problems will affect international infrastructures.

23 PUMA, STERLING HOOK up to provide software to manage handheld computers.

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36 IT MANAGERS SAY they're confident that their systems will be ready come Jan. 1.

38 LANDS' END SELLS more apparel online than any other site, thanks to good customer service.

39 STARBUCKS OFFERS its employees competitive salaries, cutting-edge technology, free coffee and discounts.

42 USERS PREPARE Y2K contingency plans, even though they expect Jan. 1 to be a routine day.

46 LAST-MINUTE CHECKS help companies reduce the chance of Y2K disasters.

48 AMERICAN INDIANS suffer from extraordinarily high unemployment, while IT departments are starving for help.

QUICKSTUDY

52 A TOTAL COST of ownership model promises lower costs, but the majority of IT administrators don't use the model.

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56 PREVENTING holiday cards from clogging your networks requires both good tools and good policies.

56 MICROSOFT has finalized its BizTalk specification, but the future of the XML-based standard is still in doubt.

EMERGING COMPANIES

58 A LOOK BACK at the 33 companies *Computerworld* has profiled since April, from those whose stocks have rocketed to those that haven't done as well.

QUICKSTUDY

60 WEB PERSONALIZATION lets you tailor customers' experiences on your site but also requires you to protect their privacy.

62 AFTER 11 MONTHS of planning, top online retailers are facing the holiday crunch. We visit several sites to see how they're faring under the flood of holiday orders.

WHY HAVE ONE IPO WHEN YOU CAN HAVE 10? WE HAVE VISIONS OF GRANDEUR.

RANDY JO WILCOX, BUYITNOW.COM LLC, A TULSA ELECTRONIC RETAILER THAT WANTS TO TAKE EACH OF ITS 14 ONLINE STORES PUBLIC SEPARATELY.
SEE PAGE 62.

OPINIONS

28 WIRELESS STANDARD will prevail, predicts Don Tapscott. He advises companies to jump into this market.

29 DAVID MOSCHELLA shares what he thinks will be the most decisive IT industry challenges in the next 10 to 20 years.

32 COMPANIES SHOULD watch out for false alarms when Jan. 1 rolls around, warns Stephen Cobb.

32 IT PROFESSIONALS need sales and public relations skills as much as ever and will for the foreseeable future, suggests John Gantz.

36 PURE DOT-COMS' days are numbered as click companies copy advantages of bricks, predicts Kevin Fogarty.

39 DON'T WAIT for Y2K-related problems to surface in mid-January; continue testing and question suppliers after New Year's, advises Ed Yourdon.

53 CONTRACTS SHOULD be written so they can be easily understood by a third party of average intelligence, Joe Auer says.

AT DEADLINE

FTC and Web Security

The Federal Trade Commission (FTC) said it will establish an advisory committee on online access and security. The 30-member committee, will recommend how commercial Web sites can give consumers access to data about themselves while ensuring that information is secure, the FTC said.

EDS Venture Fund

Electronic Data Systems Corp. is setting up a $1.5 billion corporate venture fund for business-to-business and Internet investments. The new venture – EDS/A. T. Kearney Ventures – will focus on funding EDS's Internet clients and will let EDS take equity positions in those companies. [See related story, page 12.]

SAP Training Via Web

SAP AG plans to expand an Internet-based training program for R/3 and some of its other applications. SAP officials said the first five online training classes designed for end users will be announced next month, and the German vendor also will start customizing courses for individual customers.

No Java Standard Yet

Members of Geneva-based ECMA's general assembly met last week in Germany but took no further action to standardize Java without the participation of the programming language's creator, Sun Microsystems Inc., according to ECMA Secretary General Jan van den Beld.

Short Takes

Deputy Secretary of Defense John J. Hamre said last week that the DEPARTMENT OF DEFENSE is 99.9% ready for the year 2000 date rollover. . . . In a pairing of vendors that make applications for midsize manufacturers, Atlanta-based MAPICS INC. agreed to buy PIVOTPOINT INC. in Woburn, Mass., for $48 million in cash. . . . The U.S. POSTAL SERVICE said technicians were working to fix a problem with the agency's Web server that caused the site's search functions and other mail services to fail repeatedly last week.

Shippers Try Software To Tally Foreign Tariffs

DHL Airways, others in quest to quote accurate prices for non-U.S. Web shoppers

BY CRAIG STEDMAN

THE RACE to deliver the ability to calculate the full cost of shipping products to foreign buyers is heating up as the big package carriers pair up with rival vendors of international logistics software.

But the technology still needs to be proven in real-world settings before it can be put to broad use by online retailers and other companies doing business on the Web.

"Quite frankly, there are still a number of unknowns," said Michael Comstock, senior vice president of e-commerce and planning at DHL Airways Inc. in Redwood City, Calif. "We really need to test this."

DHL Airways last week said it plans to launch several pilot projects early next year, using a landed-cost calculation engine developed by New York-based Syntra Technologies Inc.

Later this month, sources said, Atlanta-based United Parcel Service of America Inc. is expected to make a similar teaming announcement with NextLinx Corp. in Silver Spring, Md. And Memphis-based FDX Corp. is quietly working the same turf with Vastera Inc. in Dulles, Va., the sources added.

What's pushing the shipping companies to act is a burning need on the part of online retailers to be able to automatically tell overseas customers the so-called landed cost — what a product will really cost after duties, tariffs and other fees are taken into account.

"The endgame here is to be able to guarantee [the final cost]," Comstock said. That could open up international markets to online retailers that currently don't want to risk surprising overseas buyers with big bills they refuse to pay.

Healthy Discounts, a small retailer of nutritional supplements that launched a Web site last spring, quickly stopped taking overseas orders because trying to manually calculate landed costs was such a headache.

"I don't want to turn business away, but I knew we had to do it right or no one would come back," said Mariano Farrar, the owner of Healthy Discounts in Austin, Texas. And the stakes are high: Farrar said purchases by foreign distributors could eventually exceed domestic sales to consumers. Healthy Discounts plans to be one of Syntra's first users.

The landed-cost issue first emerged into the public eye last summer [Page One, July 19]. But the software is still "in the birthing stage," said John Fontanella, an analyst at AMR Research Inc. in Boston. The big question is whether vendors are feeding accurate duty and tariff data into their calculation engines, he added. ◗

JUST THE FACTS

Landed Costs

What it's all about: Landed cost is the total price that overseas buyers have to pay for a product once all the duties, tariffs and other cross-border shipment fees are added.

The issue: Online retailers and other companies doing business on the Internet have trouble calculating those costs manually. As a result, many are still turning away international orders.

What's happening now: Several small software vendors are developing landed-cost calculation engines and teaming up with different package carriers to test the applications.

UPS, FedEx, USPS Geared Up for Net Surge

Package carriers added technology for E-shopper boom

BY LINDA ROSENCRANCE

The 1998 holiday season was barely over when United Parcel Service of America Inc. starting planning for this season's surge in online and catalog shopping. Preparations at Federal Express Corp. in Memphis, Tenn., included making its online shipping application easier to use.

Even the U.S. Postal Service kicked into high gear in November, launching its Electronic Merchandise Return Service for returning Web-based purchases.

The estimates by now are familiar. This year, the number of online gift buyers will triple to 23 million from 7.5 million last year, according to a survey of 12,000 consumers conducted by the Boston Consulting Group in Toronto. These shoppers will spend $9.5 billion, according to a study by Rochester, N.Y.-based Harris Interactive Inc.

So it follows that the explosion of e-commerce has forced shipping and delivery firms to invest heavily in technology infrastructure to take advantage of the surge. "In fiscal year 1999, FedEx spent $1.9 billion on technology, while Microsoft spent a total of $3 billion. The people who say FedEx is as much a technology company as a transportation company aren't too far off," said Donald Broughton, a transportation analyst at A. G. Edwards & Sons Inc. in St. Louis.

In January, the first thing UPS did was review its logistics systems, looking at last year's performance and developing computer models for air and ground operating plans to handle this year's load. On Friday, UPS expected to deliver nearly 18 million air and ground packages globally, 5.5 million more than its average daily volume, according to UPS spokeswoman Joan Schnorbus

In June, UPS launched a package-tracking system that uses handheld computers containing an internal radio and allows for two-way communication (see chart). The system lets UPS drivers relay information to a centralized database within one second of taking a signature or order.

UPS said it implemented the new system in response to pressure from customers for immediate information about packages — and after investing $1.2 billion last year on systems to let customers track parcels and calculate shipping rates. ◗

Ready for Battle

How major couriers have prepared for the online shopping surge:

UPS

- Reviewed last year's system and developed computer models for air and ground.
- In June, launched the Delivery Information Acquisition Device III — a $100 million package-tracking system that allows drivers equipped with handheld computers to communicate with central database within one second of taking an order.

FEDERAL EXPRESS

- In May, FedEx launched a package-tracking system that allows handheld users to track their packages.

U.S. POSTAL SERVICE

- Teamed up with Seattle online retailer Altrec to launch its Electronic Merchandise Return Service, to enable returns of Web-bought goods.

MOREONLINE

For *Computerworld* coverage of the shipping industry and links to related pages, visit our Web site.
www.computerworld.com/more

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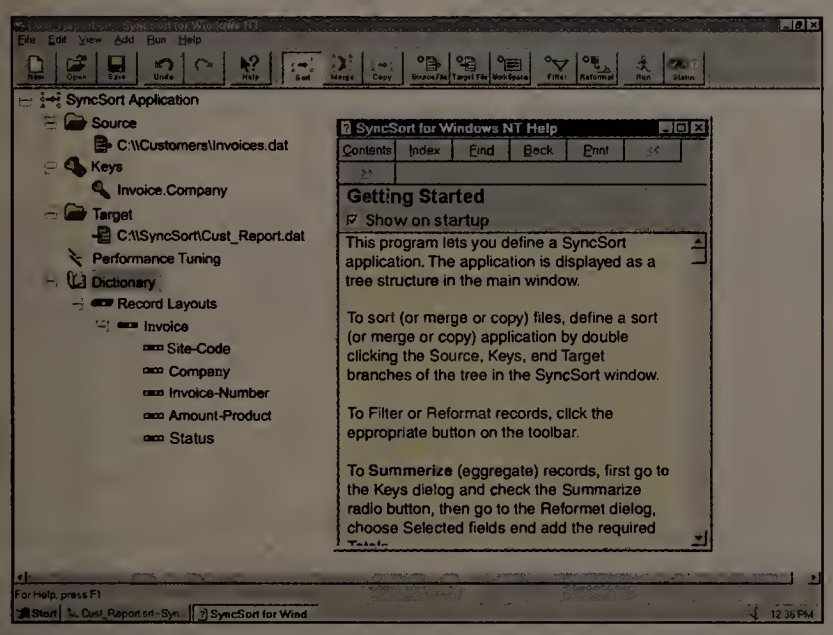

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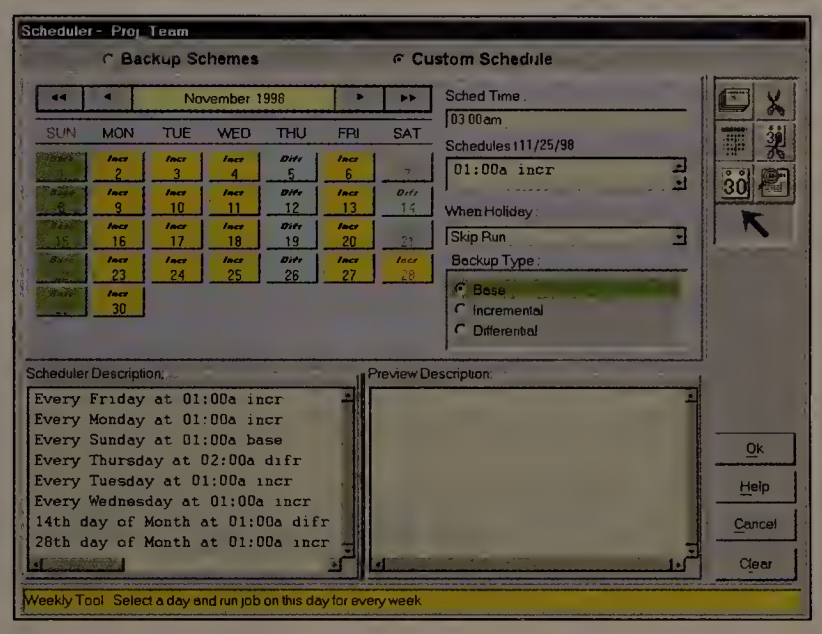

Through the simple, intuitive Backup Express interface, you can schedule backups, run restores, add devices, or check job status.

whether it is running UNIX, Windows NT, or NetWare. Yet centralized administrative control is always maintained through an intuitive drag-and-drop graphical user interface. Support for efficient online and offline database backup is also included.

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Divided E-Sales Tax Panel Lacks Data

Businesses unlikely to get guidance on Net tax issue from congressional commission

BY PATRICK THIBODEAU
SAN FRANCISCO

THE congressional commission that's charged with solving the Internet taxation puzzle argued long and hard last week over whether companies doing business on the Internet should collect taxes.

But in the end, the 19 members of the Advisory Commission on Electronic Commerce mostly relied on gut feelings and rhetorical flourish to argue their cases because they lacked hard data about the impact of Internet taxes on businesses and governments. The panel remains deeply divided.

The problem, said commission member John Sidgmore, vice chairman of MCI WorldCom Inc., is that e-commerce is still in its infancy. He said freeing Internet merchants from tax collection obligations will hurt Main Street companies, but definitive conclusions are still out of reach.

"Why wouldn't it be smarter to give it a three-year or four-year break before we conclude for sure that it should never be taxed or that it should be taxed?" Sidgmore said.

The commission may indeed punt and ask Congress to extend the current moratorium on new Internet taxes — instead of making a specific recommendation on e-commerce taxes. The Internet Tax Freedom Act Act, approved last year, set a three-year moratorium on new Internet taxes.

The commission will hold its final meeting in March in Dallas and give Congress its recommendations in April.

For businesses, the lack of consensus means continued uncertainty over how to design systems to deal with taxes (see related article below).

Businesses "should build flexibility into their systems because this is going to be an evolving debate," said commission member David Pottruck, president and co-CEO of Charles Schwab & Co. in San Francisco. "No one knows where this debate will end."

Without hard facts, the debate is turning in circles.

Commission Chairman James Gilmore, the governor of Virginia, pointed out repeatedly that sales tax collections are rising in states despite online sales. He asked South Dakota Gov. William Janklow, who was participating in the meeting as a panelist, whether sales tax revenues "are going down as a result of e-commerce."

Sales tax collections are up 6% in South Dakota, Janklow replied. "The question is, would they have gone up 9% if we were getting the money from e-commerce?" he said.

So-called brick-and-mortar companies assailed plans to limit tax collection obligations for Internet sellers.

"The U.S. government shouldn't be in the business of picking tax winners and losers," said David Bullington, vice president of Wal-Mart Stores Inc. in Bentonville, Ark., which also sells goods on the Internet and pays sales taxes in every state that collects them.

"This sends a message that the discriminatory tax policies are acceptable — they're not," Bullington said.

But he also argued that the current system is too complicated. Compliance with a hodgepodge of state laws hurts smaller businesses, he said. ◗

Points of Debate

There's no guarantee, but it's expected that the Advisory Commission on Electronic Commerce will agree on some key topics.

Internet access: The commission may recommend no taxes on Internet access charges to help keep access affordable.

Excise tax on telecommunications: A 3% federal excise tax on telephone services, set in 1898, is now seen as a burden.

International issues: Commissioners oppose e-commerce tariffs.

Taxation of digitized goods: If books downloaded off the Net aren't taxed, should books sold in physical stores be taxed?

Tax collection on remote sales: Most members agree that tax simplification is needed.

IT Managers: Net Sales Tax? No Problem

It's simple, if you build from the ground up

BY STACY COLLETT
AND PATRICK THIBODEAU

There's no consensus on whether Internet sales should be taxed, let alone the rate. But many corporate IT managers say adding the capability to collect sales taxes to their systems wouldn't be difficult.

In many cases, retail Web sites already collect some taxes. And most retailers are familiar with state tax rates because of their brick-and-mortar stores or catalog sales.

Adding various tax rates "would be very simple for us. We have that all driven by codes tables. It would just be a matter of changing [the tables] to whatever value we want to," said Kelly Curd, online director at Zones.com. Zones.com is part of PC hardware and software retailer Multiple Zones International Inc. in Renton, Wash., which collects sales tax for states that require it.

Speedo.com, Web site of athletic apparel maker Authentic Fitness Corp. in Los Angeles, also charges sales tax in states where its 139 stores and distribution centers are located. "If there are any changes to be made, we just do a change in one place and that takes care of it. We don't have to recode," said network engineer Sandeep Jolly.

But for Internet-only retailers, building in ZIP code and tax rate fields early could save millions of dollars later.

"If you haven't set up the order flow processing, it's going to involve a massive re-engineering project with millions of dollars to redo the architecture of how your system processes transactions. It's really a big deal," said Rich Prem, an expert on e-commerce tax policy at Deloitte & Touche LLP in San Francisco.

Deloitte has been showing Web site builders what changes they'd have to make under various scenarios. For example, states could levy the tax based on the product's destination. If a shopper buys five gifts and has them sent to five states, the transaction would have to be broken into five orders, Prem said.

Companies that pay some state taxes may already have the fields in place. "But if you don't have to collect tax anywhere, you might not have that in your system," Prem said.

Buyjewel.com in Ann Arbor, Mich., incorporated tax fields into its system from the beginning. "It really wasn't that difficult," said Peter Mastic, chief financial officer. The company collects sales tax in Michigan and Delaware but has already added tax fields in its online order entry system.

When it comes to taxes, IT managers "don't need to sit like deer in the headlights; you can determine what to do," said Kent Johnson, a tax expert at KPMG LLP. But "you need to develop a system that is flexible enough to adapt to whatever comes down the road." ◗

AT A GLANCE

Be Prepared

Observers advise corporate tax managers to have IT staff design systems that can handle any tax eventuality:

- Add ZIP code fields for all states in order-entry systems.
- Discuss how to identify and calculate value-added taxes and tariffs on foreign sales.

Oracle Pushes Customers to Buy Online

BY ROBIN ROBINSON

Oracle Corp. last week said it is lowering the price of its database, streamlining its discounting and moving purchases to its Web site to reduce the cost of servicing client accounts and, ultimately, to increase the market for databases.

Oracle CEO Larry Ellison said 98% of Oracle's revenue has been individually negotiated. "That's how we've done business historically. It's been a manual process, not an e-business process. We can't continue to do this. We must push more business through the Web store," Ellison said.

The Redwood Shores, Calif., company said the new service would be available today. Initially, only customers with orders of less than $500,000 will use the site, but Oracle eventually wants to process orders of up to $1 million online.

The Oracle8 users at Digital Impact Inc., a San Mateo, Calif.-based e-mail marketing firm, is Ellison's target: mid-size start-ups with a sub-$1 million database budget.

John Sullivan, operations director at Digital Impact, said Oracle's Web sales model could be perfect if it automatically processes his order.

"If it's just an order queue and they hand it off to a person . . . then I don't see any value," he said.

Oracle earlier announced its second-quarter net income was up 40% and its revenue was up 13% from the same quarter last year. Oracle's second quarter ended Nov. 30. ◗

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BRIEFS

SAP Socks Oracle Databases Again

SAP AG took another swipe at Oracle Corp.'s databases by announcing that Microsoft Corp.'s SQL Server 7.0 is now its primary development database for Windows NT and Windows 2000.

Two weeks ago, SAP said IBM's DB2 was replacing Oracle as its preferred database for key Unix and Linux systems. But the deals don't mean SAP is reducing its support for Oracle databases.

PGP Can Be Exported

Santa Clara, Calif.-based Network Associates Inc. said it has been granted a license by the U.S. government to export its full-strength PGP encryption software to all countries without restriction. The decision ends a decades-long ban on the export of strong encryption products.

Export Rules Delayed

The Clinton administration has decided to wait a month before releasing the final version of revised U.S. export controls on all strong encryption products. The White House postponed the deadline to Jan. 15 to allow for more talks with affected industries.

NCR Expands Internet Services, Outsourcing

NCR Corp. in Dayton, Ohio, will upgrade Internet banking services for East Fort Lauderdale, Fla.-based BankAtlantic. NCR also announced that it will set up an outsourcing unit that will offer customer relationship management, data warehousing and e-commerce systems.

Railroads Halt for Y2K

Two freight railroads and some Amtrak routes will temporarily suspend operations on New Year's Eve as a precaution against any year 2000-related problems. Spokesmen at Union Pacific Corp. and the Norfolk Southern Railway Co. last week said the railroads will test switches and other equipment while the trains are stopped.

Expirations of Digital Certificates Troublesome

User confusion seen as biggest problem; browser updates needed to avoid warnings

BY ANN HARRISON

E-COMMERCE sites that use digital certificates to provide encryption and reassure users that the site is authentic are being warned to upgrade any server digital certificates that are set to expire Jan. 1.

The root certificates for AT&T Corp., Needham, Mass.-based GTE CyberTrust Solutions Inc. and Mountain View, Calif.-based VeriSign Inc., which have been used to sign e-commerce site certificates for the past five years, will expire New Year's Day. A Web site certificate identifies itself to the user's browser, and a root certificate is used by the user's browser to validate the integrity of the Web site certificate, guaranteeing that both parties are who they say they are.

Vendors of expiring certificates have installed new root certificates and alerted commerce sites, but there could still be issues that cause trouble for information technology teams and unnerve customers, said Carl D. Howe, research director at Forrester Research Inc. in Cambridge, Mass.

Continued Warnings

According to Howe, thousands of sites must still replace their root certificates. And even if they do, visitors with older Netscape Communications Corp. browsers — those prior to Communicator 4.05 — will see messages warning that the certificate has expired. While users can still conduct transactions securely, they must upgrade their Netscape browsers to avoid receiving the warning on subsequent visits.

VeriSign is recommending that e-commerce vendors instruct their users to upgrade their browsers, according to vice president Anil Pereira. Meanwhile, the e-commerce sites should delete specified root certificates from certificate authorities, back up their keys and digital certificates and test their systems with VeriSign's free testing services.

Howe added that companies can also purchase site certificates that expire in 2010 and 2020 from other certificate authorities, including Entrust Technologies Inc. in Plano, Texas, Equifax Inc. in Atlanta and Thawte Consulting in Durbanville, South Africa.

Richard Pendergast, director of Travelocity Systems at Sabre Group Inc.'s Travelocity.com in Fort Worth, Texas, said his company is using the Entrust root certificates to make sure users of Netscape browsers don't see expiration messages. Travelocity is also using new root certificates from VeriSign to update Microsoft Internet Explorer browser Versions 3.0 and 3.02, which don't recognize Entrust certificates.

Travelocity took both of those steps because "the customer isn't always going to understand that this problem isn't a Y2K problem or a Web site problem but a browser problem" said Pendergast, explaining that Travelocity's goals are to offer uninterrupted service and "not to cause visitors any grief." ◗

ONLINE BROWSER FIXES

CyberTrust, Entrust and VeriSign *all have Web pages that check whether a user's browser needs an update and apply the appropriate patches.* **Carl D. Howe at Forrester Research** *suggests that e-commerce vendors copy the appropriate Web pages to their sites and e-mail customers the Web addresses with a* **money-saving coupon** *to encourage them to perform the updates. The Web addresses are:* **http://verisign.com/security/rootcert** *and* **www.gte.com/cybertrust/resources/root/browser6.htm**

Investment in Alpha Chip Reassures Users

But $500M unlikely to change market share

BY JAIKUMAR VIJAYAN

Users concerned about the long-term viability of the Alpha chip found some reassurance in the $500 million technology and marketing initiative launched last week to boost the chip's fortunes. But analysts were less upbeat.

Compaq Computer Corp., Samsung Electronics Co. in Seoul, South Korea, and Samsung subsidiary Alpha Processor Inc. announced a partnership to enhance the technology and attract software development around the platform.

The $500 million investment comes as Compaq is preparing to unveil its new Wildfire Alpha servers in February. The Unix- and OpenVMS-based systems, which scale up to 32 processors, will support advanced partitioning capabilities and are expected to be contenders at the high end.

The announcement also bolsters past statements by Compaq that it has remained fully committed to Alpha at the high end. Concerns about the future of Alpha peaked soon after Compaq's purchase of Digital Equipment Corp., the chip's inventor, in June 1998 and were fueled recently when the company said it would end Windows NT development on Alpha [News, Aug. 30].

The investment "makes me feel a whole lot better" about betting on Alpha, said Kal Raman, CIO at online drug retailer Drugstore.com Inc. in Seattle. "I think they have finally realized that their core enterprise strength lies in Alpha, and they have decided to focus on that," Raman said.

Although it's a step in the right direction for Alpha customers, "the real question is whether it is too little, too late" to improve Alpha's market share, said James Garden, an analyst at Technology Business Research Inc. in Hampton, N.H. Large portions of the investment will go toward playing technological catch-up with IBM RISC processors and attracting independent software vendors, he said.

Specific steps that are expected after the investment include the following:

- Investments by Samsung will introduce some performance-enhancing technologies such as copper interconnect and silicon-on-insulator.
- Partnerships with and funding for Linux software vendors. Compaq is hoping to to make Linux — rather than Windows NT — the mass-volume operating system on Alpha.
- A fourfold increase in Compaq funding — from the $100 million announced in September — for Tru64 Unix on Alpha development is expected.
- Business development initiatives should push Alpha servers into new markets such as network appliances.

"This is exactly the kind of validation of Compaq's commitment to Alpha" that enterprise users are looking for, said Jeff Killeen, a board member at the Digital Equipment Computer Users Society. "It shows they are betting on Alpha as their enterprise [platform]," he said.

Apart from reassuring the customer base, last week's investment will do little to change Alpha's competitive positioning, said Mike Feibus, an analyst at Mercury Research in Scottsdale, Ariz. But Feibus noted that support for Linux could help boost the platform's sales at the low end. ◗

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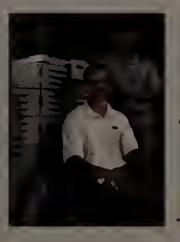

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Wireless App Protocol Builds Momentum

BY DOMINIQUE DECKMYN

The past few weeks have seen a flurry of new products and services for wireless phones based on the Wireless Application Protocol (WAP). But analysts and users say enterprise adoption is still a while off.

Last week alone, TD Waterhouse Group Inc. in New York said it would offer stock trading from WAP-enabled phones; Harris Bankcorp Inc. in Chicago announced market trials of wireless banking, including access to account balances and fund transfers; Swissair AG in Zurich said it would let its passengers check in wirelessly; and Comtex News Network Inc. in Alexandria, Va., joined the ranks of vendors offering personalized news feeds.

In addition, the first enterprise services are appearing: Infowave Software Inc. in Burnaby, British Columbia, said it would offer WAP access to Microsoft Exchange servers; Maconomy Corp. in Copenhagen introduced a WAP front end to its time- and expense-report software; and middleware vendor Iona Technologies Inc. in Dublin said it would build WAP support into its iPortal Server so wireless users can access corporate portals.

WAP services on the Internet will grow from a few hundred today to thousands within the next six months, said David Hayden, an analyst at research firm Mobile Insights Inc. in Mountain View, Calif.

"Everybody's been waiting on the sidelines to see whether this would take off. But now we've seen Microsoft join the fray, and that has been a wake-up call," said Hayden. Earlier this month, Microsoft Corp. announced its Mobile Explorer software, which supports WAP.

How Soon?

Hayden predicted that the next three months will bring more enterprise-ready services such as e-mail, contact synchronization and scheduling. But enterprises may be slow on the uptake.

"I'm sure [WAP is] going to be hot, but not right now," said Alex Hu, a senior technology officer at The Chase Manhattan Corp. in New York. Hu said the company is trying to figure out how to leverage the Palm beyond its use as a personal information manager.

WAP phones aren't yet widely deployed in the U.S. "Right now, the enterprise is focusing on integrating the PalmPilot. Smart phones in the enterprise are years off," Hayden said.

Some analysts are even more skeptical about WAP. Using the protocol to access corporate networks "doesn't make any sense at all," said Elliott Hamilton, senior vice president at market research firm Strategis Group Inc. in Washington. Enterprises will wait until high-bandwidth wireless Internet access becomes available in about two years, Hamilton said. WAP owes its success to its ability to work well on low-bandwidth connections. ◗

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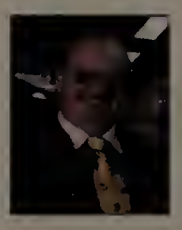

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Spun-off Sabre to Sell Software to AMR Rivals

Competitors will gain access to pricing software, outsourcing opportunities

BY STACY COLLETT

AIRLINES will soon be able to tap into Sabre Holdings Corp.'s management and pricing software, which was once under the exclusive control of American Airlines.

Fort Worth, Texas-based parent AMR Corp. said last week it will spin off its 83% ownership stake in the reservation services unit by the first quarter of next year.

When the deal is final, Sabre will become a fully independent company free to sell its reservation software and services to American's competitors without restrictions.

AMR Chairman Donald J. Carty said the time is right for Sabre to pursue new business without AMR's backing. Others said the spin-off frees Sabre from potential conflicts of interest.

"One of the problems we faced in the past [with other airlines and hoteliers] is they'd say, 'Because of your relationship with American Airlines, is our information secure? Can you really form some different kinds of relationships and do ... technology transfers?' And although it is absolutely secure ... you still have that perception. I believe [the spin-off] will help that," said James Poage, senior vice president of worldwide marketing at Sabre.

"Sabre's technology has generally been cutting-edge, so the fact that the best is available from Sabre could be a big factor," said Michael Roach, president of Roberts, Roach & Associates Inc., an aviation consultancy in Hayward, Calif.

Sabre will also aggressively market its outsourcing services to airlines that were once concerned about conflicts of interests. More than 80% of the airline industry's information technology functions are handled in-house, said newly appointed Sabre President and CEO William J. Hannigan.

Sabre hasn't won a significant outsourcing contract since January 1998, when US Airways Group Inc. in Arlington, Va., signed a 25-year, $6 billion deal to outsource its entire IT infrastructure.

Last week, Sabre lost its bid to outsource Chicago-based United Air Lines Inc.'s Internet, sales support and hosting and development services to United's longtime travel-distribution partner, Galileo International Inc. in Rosemont, Ill.

Hannigan said he plans to increase outsourcing revenue by at least 15% each quarter.

In addition, Sabre will handle IT operations for American through 2008 and help it establish a decision-support center, with American hiring up to 25 members of Sabre's IT staff. No IT jobs will be lost in the spin-off, Carty said.

AT A GLANCE

Sabre

Base: Fort Worth, Texas

Employees: 10,000 in 45 countries

1998 Revenue: $2.3 billion – 60% from ticket distribution and 40% from IT services

Assets: Owns 70% of Travelocity.com; owns Sabre BTS corporate travel service; hosts Cheaptickets.com and Lowestfare.com

SOURCE: SABRE HOLDINGS INC

ADP Bulks Up to Handle Online Trading

Upgrade lets it process trades in real time

BY THOMAS HOFFMAN

ADP'S JOHN DONKERSLOOT: Effort will grow business

While retail stock brokerages bask in the online trading spotlight, back-office service vendors such as ADP Brokerage Services Group often do the behind-the-scenes work to process their trades fast and without a hitch.

But that requires a heavy investment in technology. So ADP this month completed the first phase of a multitiered effort to upgrade its order-processing system, *Computerworld* has learned.

According to analysts, it's a multimillion-dollar upgrade to an IBM Sysplex hardware architecture and a rules-based software engine, which is expected to help ADP handle a growing influx of online stock trades. Orders that originate over the Internet have grown more than 300% over the past 12 months.

Out of the nearly $2 billion Wall Street firms spent on global processing systems this year, roughly 70% went to external vendors such as ADP, which is the market leader with about 300 customers, according to TowerGroup, a financial services consultancy in Needham, Mass. Competitors include the Pershing division of Donaldson, Lufkin & Jenrette, as well as other brokerages, analysts said.

At ADP Brokerage Services, the technology upgrade is expected to help bring in new clients and more business from existing clients, said John Donkersloot, chief technology officer. The Jersey City, N.J., business is a division of the giant service bureau Automatic Data Processing Inc.

Under the project, launched 18 months ago, ADP replaced a mix of IBM OS/390 mainframes and Digital Equipment Corp. PDP-11 and Alpha NT servers with a more powerful and scalable IBM Sysplex clustered processing system.

The core components of the new order management system include a rules engine and a dynamic message formatter from New Era of Networks Inc. in Englewood, Colo., which combine with an IBM DB2 database to keep both a transient and permanent record of each transaction.

Prior to the upgrade, it was difficult for ADP to handle its volumes of more than 1.2 billion transactions per day, Donkersloot said. In order to route all of those transactions effectively, ADP would often have to create a second partition within a processor, which was a very "labor-intensive process," he said. With the added software and hardware capacity, "we get immediate scalability and a much more reliable processing environment."

ADP customers will continue to route their stock trades and orders to the company using dedicated T1 and other private communications links, Donkersloot said.

IBM, Others Join E-Venture Fund Rush

HP, Sun, consultants offer cash, financing

BY JAIKUMAR VIJAYAN

The rush by technology firms to finance e-commerce ventures is gaining momentum.

IBM last week announced an alliance with Ernst & Young LLP under which IBM's Global Financing group will provide financing for e-commerce projects by Ernst & Young clients.

Ernst & Young's customers are expected to use nearly $500 million in IBM funding during the next year, said Sam Khanna, an IBM vice president.

In a similar move, Andersen Consulting said it's forming a venture capital firm, called Andersen Consulting Ventures, that will invest $1 billion over the next five years in e-commerce businesses. Andersen will spend $500 million of its own money; the rest will come from venture capital firms.

As part of its financing arrangements, Andersen's new unit will in some cases also get into equity arrangements with dot-com start-ups.

Another integrator, Cambridge Technology Partners, announced plans to set up a fund to help dot-com start-ups.

IBM, Ernst & Young, Andersen and Cambridge Technology join a growing list of companies trying to underwrite the demand for capital that's being created by dot-com start-ups and e-commerce projects, said Gopi Bala, an analyst at The Yankee Group in Boston.

Growing Trend

"Companies with ready finance are looking to invest in some fashion in the Internet economy regardless of their core businesses," Bala said. "Look for the trend to grow" as corporations start getting to e-commerce projects that have been put on the back burner by Y2K work, Bala said.

Hewlett-Packard Co. has been one of the most aggressive technology vendors in funding and financing e-commerce ventures. It has set aside $1 billion for that purpose and has been busily signing up partners. HP, for instance, inked a five-year deal with Colorado Springs-based USA.Net. The agreement calls for HP to provide $15 million worth of hardware for an equity stake and a share of USA.Net's future revenue.

Rival Sun Microsystems Inc. has been busy, too. The company has a similar financing program for dot-com start-ups. But unlike HP, Sun doesn't plan to get into any equity partnerships with its customers.

"The largest system vendors are trying to give added value" by extending e-commerce-related financing options to customers, said Joyce Becknell, an analyst at Aberdeen Group Inc. in Boston.

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BRIEFS

Fiber for BellSouth

Marconi Communications has announced that BellSouth Corp. next year will install Marconi's Asynchronous Transfer Mode-based DISC MX high-speed fiber-optic technology for voice, video and data. The installation will serve the parts of BellSouth's network that aren't served by the 280,000 fiber-optic lines BellSouth installed in the Atlanta and southern Florida regions earlier this year.

Shiloh's New Name

Microsoft Corp. has christened the next release of its SQL database server as SQL Server 2000. Formerly code-named Shiloh, SQL Server 2000 is slated to be commercially available in the first half of next year.

E-Commerce Jumps

The number of holiday e-commerce shoppers rose 3.4% for the week ending Dec. 12 compared with the prior week, according to Nielsen Media Research Inc. and NetRatings Inc. in New York. Traffic at gift sites increased the most, rising 32.5% from the previous week. The next biggest increases were at online malls (15.7%); sites that sell books, music and videos (12.0%); and electronics sites (10.5%).

Shoppers Beware

The Electronic Privacy Information Center, a privacy research group, has released a report warning online holiday shoppers that their privacy is at risk. According to the report, few of the 100 most popular shopping Web sites provide adequate privacy protection for consumers.

E-Service Protocol

Lionbridge Technologies Inc., Akamai Technologies Inc., Network Appliance and other companies are working on a protocol for Web advertising, virus scanning, content filtering, data compression and language translation on Internet access devices. Called the Internet Content Adaptation Protocol, it will be presented to the Internet Engineering Task Force early next year.

NetWare Update Runs Into Windows

Users see NT, 2000 as strong alternatives

BY DAVID ORENSTEIN

EVEN WITH its Web emphasis, the new version of NetWare appears unlikely to stem the operating system's eroding market share that has resulted from its pounding from Windows, users and analysts said.

Novell Inc. officials said last week that NetWare 5.1 will be available in mid-January at prices starting at $95 per node. The software will include a variety of Web application software, including Oracle Corp.'s 8i database and IBM's WebSphere application server and a Java virtual machine.

Some analysts have said the package is Novell's best attempt yet to make NetWare an application platform [News, Nov. 8].

But while NetWare users respect the technology, some say they won't adopt it.

"I kind of feel sorry for Novell," said Allan Klein, director of PC LAN services at SuperValu Inc., a food distributor in Minneapolis.

But SuperValu's information technology budget includes money to begin a migration from NetWare to Microsoft Corp.'s Windows 2000 next year. The company will upgrade its NetWare servers to Version 5.0 but will use it only until Windows 2000 is ready to take over, he said. "Our view of NetWare right now is very short term," Klein said.

Even now that Novell provides full integration with Java and Web development tools, there is still no compelling reason to use NetWare rather than other platforms that run the tools, said analyst Dan Kusnetzky at International Data Corp. (IDC) in Framingham, Mass.

An IDC study of 417 NetWare users in February found that while one in five would use it as a Web server by 2001, the same proportion would replace at least one of their NetWare servers, usually with Windows.

The future of NetWare at Compass Bancshares Inc. in Birmingham, Ala., may be up in the air, said senior network administrator Chris McGuire. The company's investment in Novell's NetWare, Novell Directory Services and ZenWorks PC management tool is heavy enough for use of the software to survive in the organization, he said. But Windows NT, despite its security flaws, will likely remain a strong contender for application serving.

At least in certain places, NetWare 5.1 is sure to play an application server role. Andy Kiolbasa, who manages information technology in two divisions at ITT Industries Inc. in White Plains, N.Y., said the NetWare servers in about 100 of the company's field offices will be able to host applications when they're upgraded to NetWare 5.1.

But according to Gartner Group Inc. in Stamford, Conn., sales of Windows NT and 2000 will grow from $6.7 billion in 1998 to $21.8 billion in 2004, while NetWare will ebb from $3.2 billion to $1.2 billion. ◗

Win 2K Heads to Production

BY DAVID ORENSTEIN

Microsoft Corp. released three versions of Windows 2000 — Professional, Server and Advanced Server — to its manufacturing facilities last week, signaling it's done developing the next generation of its flagship product.

The product will be made available to enterprise users with select licenses by early next month, Microsoft said. The retail release date is Feb. 17.

Some adopters are already under way with deployments. Microsoft officials said San Francisco-based Wells Fargo Bank has begun deploying the operating system, as has the parent company of the Arizona Diamondbacks and Phoenix Suns sports teams.

Also among the first production users of the "gold code" will be furniture retailer HomeLife Inc., which will roll it out to hundreds of desktops at its Hoffman Estates, Ill., headquarters today. CIO Christopher Smith said two weeks ago that the company expected to receive the commercial-grade Windows 2000 code Dec. 15.

Another enterprise user at a major West Coast financial company said there is likely to be little real difference between the gold code and the code in Release Candidate 3, the last beta version. "It is just bug fixes at this point," he said.

Microsoft took more than two years to bring Windows 2000 to market and ran it through six beta versions, including several that were sent to hundreds of thousands of users. Jim Allchin, vice president of Microsoft's Platforms Group, said the company may have spent as much as $1 billion to create the software.

Users and analysts have said that the operating system is expected to be adopted slowly, because it involves extensive changes. ◗

Whittman, USWeb to Merge

Say deals won't govern offerings

BY DAVID ORENSTEIN AND JULEKHA DASH

Microsoft Corp. partner USWeb/CKS Inc. last week signed a merger agreement with Novell Inc. partner Whittman-Hart Inc., but the merger partners pledged to be agnostic about both investors' technologies.

The firm, to be based in Chicago, will have 8,000 employees in 13 countries and more than $1 billion in revenue.

Both companies recently cut separate deals to promote competing technologies. In September, Microsoft invested $90 million in San Francisco-based USWeb. A USWeb spokesman said that although the Microsoft deal will continue, "we like to call ourselves technology agnostic."

Ironically, Chicago-based Whittman-Hart, whose CEO will run the combined company, received $100 million from Novell this fall. A Whittman-Hart spokesman said the company will apply the best technology to suit a client's need.

Lewis Clark, an analyst at Dataquest in Lowell, Mass., said that because each company has a different approach, the merger shouldn't create direct conflicts for users. USWeb includes the Microsoft platform as part of its application hosting service. Whittman-Hart, which uses Novell technology, focuses on client implementations.

The new company will provide users with "a broader range of technology for whatever platform the client already has in place," Clark said.

Pat Connolly, executive vice president at San Francisco-based Williams-Sonoma Inc., a USWeb client, said that despite USWeb's commitment to Microsoft, USWeb won't make technology choices that would jeopardize its relationship with clients. He said he expects USWeb to "look at all the available technologies and make the right recommendations."

Even after the merger announcement, USWeb attracted a unilateral investment from 3Com Corp. in Santa Clara, Calif. It invested $100 million to jointly build wireless applications and voice, video and data networks for customers. The merger pleased 3Com, said spokesman Brian Johnson. "If you had a straw long enough to sip from the happy cup we are passing around, I'd invite you to," he said. ◗

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Reorg Aims to Put SAP Closer to Users

Focus will be on more individual attention

BY CRAIG STEDMAN

SAP AG'S U.S. subsidiary plans to kick off the new year with two big changes that will impact users: a sales force overhaul and the long-promised rollout of new software packaging and pricing.

The two moves are key pieces of SAP's effort to extend its reach beyond the back-office stronghold of R/3 into newer applications such as e-commerce and customer relationship management.

For example, the sales reorganization is aimed at making sure SAP doesn't pay attention to users only when they're getting ready to buy more software. Users and analysts said that's a change the German vendor has to make to stay in the good graces of R/3 customers who may eventually add more of its applications.

Until now, SAP's rush to sell R/3 to new users meant its salespeople might not have much time to spend with "the customers that got them where they are," said Robert Rubin, CIO at Elf Atochem North America Inc., a chemicals maker in Philadelphia.

The lack of attention was becoming a concern to Rubin because Elf Atochem may expand its R/3-based enterprise resource planning (ERP) system into areas like data warehousing and e-commerce.

CIO ROBERT RUBIN: "It's not enough just to have a good ERP system anymore"

"It's not enough just to have a good ERP system anymore," Rubin said. "And SAP's salespeople have to be available to help us move to where we want to go. They can't just say they'll come back when we have another project on the table."

That's the kind of brush-off SAP is trying to eliminate with the reorganization, said Chris Larsen, who earlier this month was named president of SAP America Inc. in Newtown Square, Pa.

The reorganization will do away with a global-accounts team that handled only users with annual revenue of at least $2.5 billion, Larsen said. Salespeople also will no longer be assigned to work with users in different parts of the U.S. and Canada.

New sales teams will be responsible for all users in specific industries and geographic areas, which should free them up to spend more time with individual users, Larsen said.

Developing tighter relationships with users also might help SAP head off the problem installations that have plagued companies such as Hershey Foods Corp. in recent months, said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Berkeley, Calif.

New software packaging and pricing is also due to take effect next month after more than a year of development [News, July 26]. Rubin said the new approach — which combines R/3 and SAP's other applications into bundles designed for different end users in a company — looks to be more flexible than SAP's current pricing scheme. ◗

Guidelines Update MIS Degree Curriculum

Standard adds business, project management

BY JULEKHA DASH

A four-year effort to modernize the curriculum for getting a master's degree in information systems — and to make it more relevant to business needs — is almost finished.

The model curriculum is likely to gain final approval from the New York-based Association for Computing Machinery (ACM) this week, task force members said.

New requirements include courses in project management, technology and business, as well as general business skills.

The guidelines have already received endorsement from more than a half-dozen academic and computing organizations, including the Society for Information Management. And at least 50 colleges and universities have committed to the curriculum.

Members of the Masters in Information Systems (MSIS) 2000 curriculum task force said the new model will update ACM standards originally set forth in 1982.

The updated curriculum had input from more than 30 Fortune 500 companies.

Rich Delisante, director of systems training at The Prudential Insurance Company of America in Newark, N.J., said courses such as project management would help train workers who can manage information technology projects as more firms outsource technology initiatives to consultants.

Historically, IT training has focused on pure technology skills, such as coding.

Stewart Breslow, a divisional vice president at New York-based PaineWebber Inc., said a course curriculum that marries business strategy and managing technology means graduates could better manage e-commerce initiatives as a company seeks to "marry financial advice with technology."

Both Prudential and PaineWebber were among the companies that provided input to the task force's guidelines. And both have at least 50 employees enrolled in the IS program at Stevens Institute of Technology in Hoboken, N.J. Stevens has already adopted much of the proposed curriculum's guidelines, according to Jerry Luftman, a professor who was one of the MSIS 2000 architects.

Luftman said he's optimistic that ACM — which has more than 80,000 members from industry and academia — will approve the proposed guidelines this week.

"ACM carries a tremendous amount of respect in the community," said John Gorgone, professor of computer information systems at Bentley College in Waltham, Mass. Gorgone, who also served on the MSIS 2000 committee, said Bentley has adopted much of the proposed guidelines as well.

The Association for Information Systems has already approved the new standards. ◗

JUST THE FACTS

IT Manager's Curriculum

An example of a proposed MSIS 2000 course guideline:

Catalog description: Managing projects within an organizational context, including the processes related to initiating, planning, executing, controlling, reporting and closing a project.

Objectives: Develop detailed project plans, develop project schedules, develop project budgets, estimate project resources, allocate and coordinate resources and serve as liaison to management.

Netscape E-Mail Passwords Vulnerable

BY ANN HARRISON

A flaw discovered in the system used to encrypt passwords for Netscape's e-mail service could imperil businesses that use older versions of the Netscape Navigator browser, which is vulnerable to remote password theft, the company that found the flaw said last week.

The current Version 4.7 of Navigator has plugged the security hole that permitted the exploit, but potential thieves might still be able to read passwords if they have physical access to a machine.

Accessing a Netscape mail password would allow an intruder to maliciously spoof the individual's mail or gain access to other secured machines the individual accesses using the same password, said Gary McGraw, chief technology officer at Reliable Software Technologies Inc. in Dulles, Va., where the flaw was discovered.

"People need to think about changing their password on the e-mail site to a password they don't use somewhere else, such as your server, your databases or your bank account," said Harry Fenik, a vice president at Zona Research Inc. in Redwood City, Calif.

Chris Saito, a senior director at Netscape Communications Corp., said users concerned about the strength of password encryption should physically secure their machines and enter their passwords each time they log on to access their e-mail.

Saito acknowledged that Versions 4.0 and 4.04 of the Netscape browser are vulnerable to the exploit, which allows an encrypted mail password to be retrieved remotely by a rogue Web site. He said that although patches exist to fend off the attack, Netscape advises users to upgrade to Version 4.7.

The flaw was discovered by engineers at Reliable Software who were writing a tool to look for information on keys and other sensitive material on the hard drive and tested it on the Netscape Windows Registry file, which stores password and other user information.

Fenik said he was surprised that Netscape had no immediate plans to change the algorithm or issue a patch, but he added that the mechanism that forces users to memorize different passwords for different systems is flawed. "The fact that you have to log into everything separately and there is no properly encrypted management system for all your passwords is a shame," and changes are long overdue, he said. ◗

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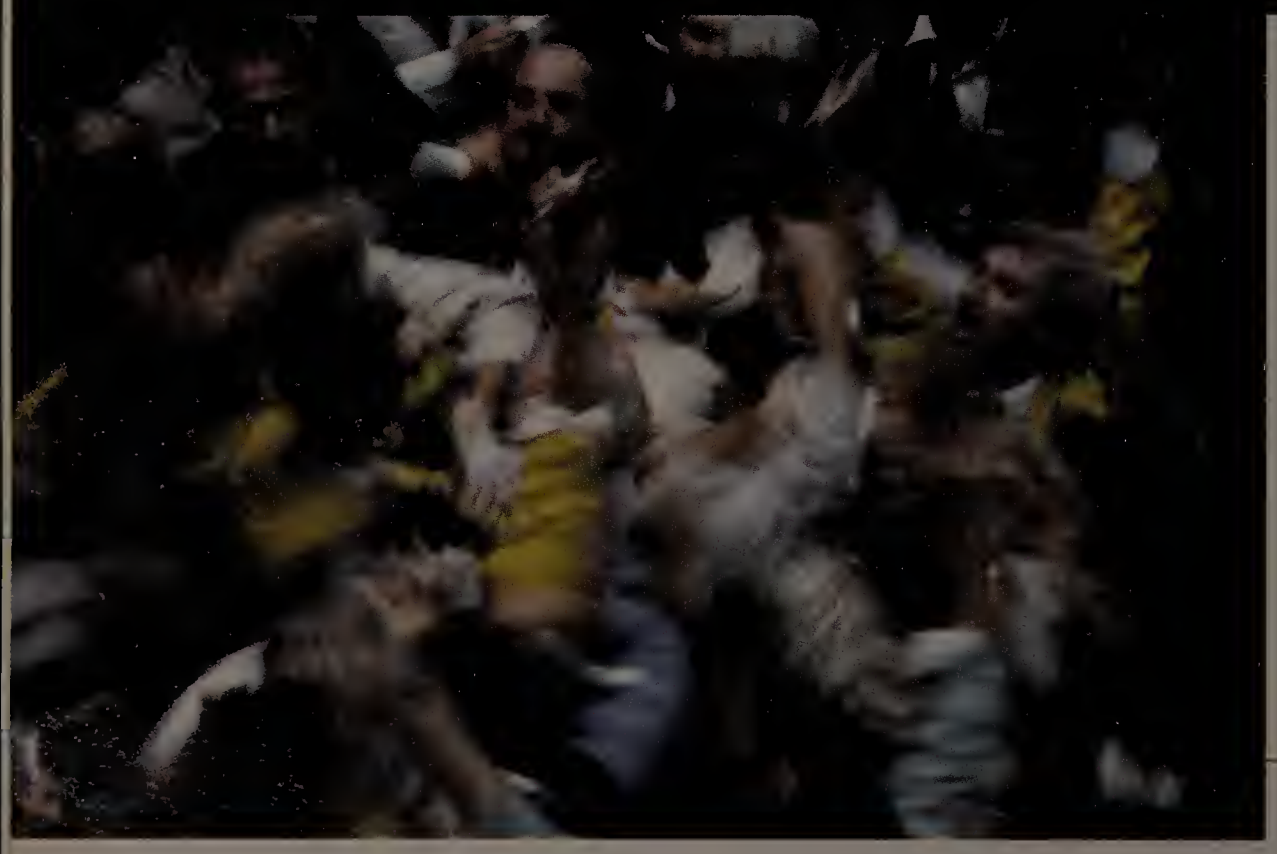

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Microsoft Windows 2000 Datacenter Server

Big Merger Year Leaves Out IT

Driven by business goals, mergers often leave IT to pick up pieces, analysts say

BY JULIA KING

AS THE CHART below shows, big companies in the telecommunications, utilities and oil industries got even bigger in 1999. Yet it's doubtful that any of the firms involved in the top dozen mergers will operate information technology any more efficiently or cost-effectively — at least not for a few years.

Even worse is that some of the new giants will likely fall behind in all-important electronic-business initiatives as they focus on melding disparate technology architectures and organizations.

On the IT front, analysts said, companies have learned few, if any, lessons from big companies that have merged before them. For example, they continue to issue multibillion-dollar savings projections based on scant premerger research and minimize the negative impact of cultural clashes on a combined company's bottom line.

A case in point is British oil giant BP Amoco PLC's $34 billion merger with Atlantic Richfield Co. (Arco). BP Amoco operates a largely outsourced SAP AG R/3 software environment. Los Angeles-based Arco, on the other hand, operates mostly proprietary mainframe-based systems.

BP Amoco is counting on saving $1 billion by eliminating overlapping operations and integrating systems at Arco and Amoco, which it acquired less than a year before the Arco merger announcement in April.

A High Price to Pay

But the cost of integrating three different systems into one could end up costing 10 times more than the annual savings it would yield, according to Syd Hutchinson, a senior consultant at Compass America Inc., an IT performance consultancy in Reston, Va.

"What I've seen with big mergers is that IT doesn't seem to be considered as anything other than an opportunity to achieve economies of scale," even though that's a shortsighted view, said Bob Gold, another Compass analyst.

But that lesson never seems to take because "the people who arrange mergers are very often not the ones who manage the postmerger organizations," Gold said. "There's so much movement in IT that I don't see a learning process going on."

Instead, analysts agreed that what often happens is IT becomes more costly, at least in the years immediately following the merger.

"You've got incompatible ERP systems, incompatible technology architectures and a huge investment ahead in integrating them, which is going to dilute much of the value that was assumed with these mergers," said Michael Keating, an analyst who specializes in electronic-business practices at Arthur D. Little Inc. in Cambridge, Mass.

Moreover, the time and expense of integrating existing systems "may, in fact, retard" some of the new giants' e-commerce efforts, Keating said.

Virtually all large companies continue "to do very little due diligence" on the IT front prior to a merger agreement, according to Fred Magee, an independent IT strategy and organizational consultant in Boston.

A rush to find a competitive advantage --- and make moves before rivals do — has driven mergers in the late 1990s, Magee said. "When you couple that with the fact that IT consistently has been ignored or pales in importance compared to marketing concerns or the financial impact, there's still just not a great deal of understanding on the part of business leaders about what the IT issues are in a merger."

1999's Biggest Mergers

ACQUIRED COMPANY	ACQUIRING COMPANY	DATE MERGER ANNOUNCED	MERGER VALUE	IMPACT ON IT
Sprint Corp. Kansas City, Mo.	MCI WorldCom Inc. Washington	Oct. 5	$127.3 billion	Cultural mismatch. Sprint is widely perceived as the better customer service provider. Acquisition of Sprint gives MCI WorldCom increased capabilities in the wireless services arena.
Warner-Lambert Co. Morris Plains, N.J. (Merger is being challenged by Pfizer Inc.)	American Home Products Corp. Madison, N.J.	Nov. 4	$76 billion	Both companies use SAP AG's R/3 software, but due to highly customized implementations, they face an enormous systems integration job, which could take years to complete. American Home Products also uses J. D. Edwards & Co. software, which must be integrated into the combined company's operations.
Air Touch Communications Inc. San Francisco	Vodafone Group PLC London	Jan. 18	$65.9 billion	Challenges include melding U.S. and European IT cultures and dealing with multiple digital mobile standards in the U.S. compared with Europe's single digitalization standard for mobile communications.
Media One Group Inc.	AT&T Corp.	April 22	$63.1 billion	Cable network upgrades needed to provide high-speed Internet services will cost billions of dollars and take several years, according to analysts.
US West Inc. Denver	Qwest Communications International Inc. Denver	June 14	$48.4 billion	Companies are now reviewing combined IT assets and designing a systems integration plan. Analysts point to a cultural mismatch between the former regional Bell operating company, which provides local telephone services, and the upstart Internet services provider.
CBS Corp. New York	Viacom Inc. New York	Sept. 7	$40.8 billion	Key challenges include creating an Internet strategy to cross-promote brands and a network to support far-flung TV stations. No decision yet on new CIO, according to a CBS spokesman.
Atlantic Richfield Co. (Arco) Los Angeles	BP Amoco PLC London	April 1	$33.7 billion	Analysts say integrating disparate systems could cost 10 times more than any possible IT cost savings. Companies will standardize on SAP R/3 software for financial processes. Arco will switch from Oracle Corp. to SAP software for upstream operations. BP Amoco expects savings of $1 billion from combining processes and eliminating overlap.
AMFM Inc. Dallas	Clear Channel Communications San Antonio	Oct. 4	$21.8 billion	Faces a huge challenge in developing and implementing an Internet strategy for the combined company's more than 800 radio stations.
Ascend Communications Inc. Alameda, Calif.	Lucent Technologies Inc. Murray Hill, N.J.	Jan. 13	$21 billion	Ascend's employees joined with workers from Lucent's Data Networking Systems to form a new Broadband Networks Group within Lucent.
Unicom Corp. Chicago	Peco Energy Co. Philadelphia	Sept. 23	$17.2 billion	IT employees from Peco and Unicom become employees of an as-yet unnamed holding company. Operations strategy yet to be decided. Peco's day-to-day IT operations are largely outsourced to CSC Corp., while Unicom handles IT in-house.
Honeywell Inc. Minneapolis	AlliedSignal Inc. Morristown, N.J.	June 7	$15.5 billion	Mismatch of IT strategies, with Honeywell outsourcing up to 50% of day-to-day IT operations and AlliedSignal running IT in-house. Merger is supposed to save $500 million through cost-cutting measures, including eliminating 4,500 jobs, or about 3.6% of the combined workforce. Honeywell's Minneapolis headquarters will be closed, displacing 185 IT workers.
BankBoston Corp. Boston	Fleet Financial Group Inc. Boston, Mass.	March 14	$15 billion	Systems integration work to begin in February and continue through the end of 2000. Freeze initiated on hiring new IT employees from outside of either company's existing IT groups.

SOURCES: THOMSON FINANCIAL SECURITIES DATA, MERGERSTAT, *COMPUTERWORLD* ONLINE AND PRINT REPORTS, COMPANY WEB SITES, ANNUAL REPORTS AND COMPANY SPOKESMEN

Report: Global Y2K Problems Will Have Limited Impact

Some see UN-sponsored study as overly optimistic

BY THOMAS HOFFMAN

A new report is cautiously optimistic about how the world will handle the year 2000 date change, predicting that many errors will occur but will have only a limited impact on national infrastructure services such as energy, telecommunications and transportation.

But considering how many nations were lagging with their Y2K projects just a few months ago, skeptics called the new report by the United Nations-sponsored International Y2K Cooperation Center (IY2KCC) a leap of faith.

"It has taken five to six years for the U.S. to get ready," said Kazim Isfahani, a year 2000 analyst at Cambridge, Mass.-based Giga Information Group Inc. Now countries such as Italy and Spain — which experts characterized as seriously behind in their work just six months ago — "are suddenly ready? That's ridiculous," he said.

The report, released last week, said governments and businesses around the world will suffer only limited damages resulting from Y2K-related snafus. The report cites factors such as a generally accelerated international response to Y2K over the past several months and the fact that the infrastructures for most developing countries don't rely on computer automation.

The report drew some conclusions that are similar to those in other global Y2K-readiness reports, including an August study issued by Gartner Group Inc. in Stamford, Conn. For instance, like Gartner Group, the IY2KCC report labeled health care as a high-risk area, in part because medical facilities in the U.S. and abroad have been late in responding to the year 2000 problem.

Gartner ranked Russia as the country facing the highest Y2K-related risks, but the IY2KCC report didn't rank Russia at all because that country didn't provide any public information about its status.

Gartner used additional methods of assessing Y2K-related risks on a country-by-country level, including each nation's reliance upon information technology and communications, as well as trade dependencies as a percentage of gross domestic product.

New Viruses Act Like Y2K Glitches

BY ANN HARRISON

A growing collection of viruses, worms and Trojan horse programs are exploiting the year 2000 date change, further bedeviling information technology managers who already are on alert for Y2K software glitches.

Some threats, such as the recent Babalonia virus, attempt to present themselves as Y2K fixes. Others, including the recently discovered W32/Mypics computer worm, are set to activate Jan. 1 and are disguised as Y2K glitches.

The worm overwrites checksum data in the host computer's CMOS memory, which will seem like a Y2K error in the computer's BIOS.

Other Y2K-related viruses, worms and Trojan horses include Troj.Polyglot (also known as Y2K Count), Worm.Fix2001, W97M.Chantal.A and W97M.MMKV.

Proper Precautions

Antivirus software vendors recommend that companies deploy the latest virus definitions and engines on gateways, file servers and desktop systems. They suggest using Y2K auditing sessions to make sure definitions are up-to-date and advise e-mailing alerts to employees about Y2K hoaxes and safe software practices.

One IT manager at an electronics firm, who asked not to be identified, said his company detected a W32/Mypics infection in a remote office and discovered four servers that weren't cleaning the virus from the network with antivirus software.

The firm's engineers wanted to try to fix the server problem, but the manager said it was more important to download another antivirus update and quickly block the malicious code than to figure out why the servers were malfunctioning.

"The key to fighting viruses is doing it quickly. If it takes two days, it's too late," he said.

Because jittery users are likely to assume that every system crash around the new year is caused by a year 2000 virus, Symantec Corp., in Cupertino, Calif., advises companies to set up Y2K phone or e-mail hot lines to streamline the submission of suspect files and reports.

VIRUS NAME

W32/Mypics

Payload: Changes user's home page on Internet Explorer to site containing adult content. Attempts to reformat local hard drives and erase all data.

Method of propagation: Received as an e-mail attachment disguised as a picture. Sends itself to up to 50 people in the infected user's Microsoft Outlook address book.

Characteristics: Arrives in an e-mail with no subject line. The body of the message reads, "Here's some pictures for you!" The message contains a "Pics4You.exe" attachment.

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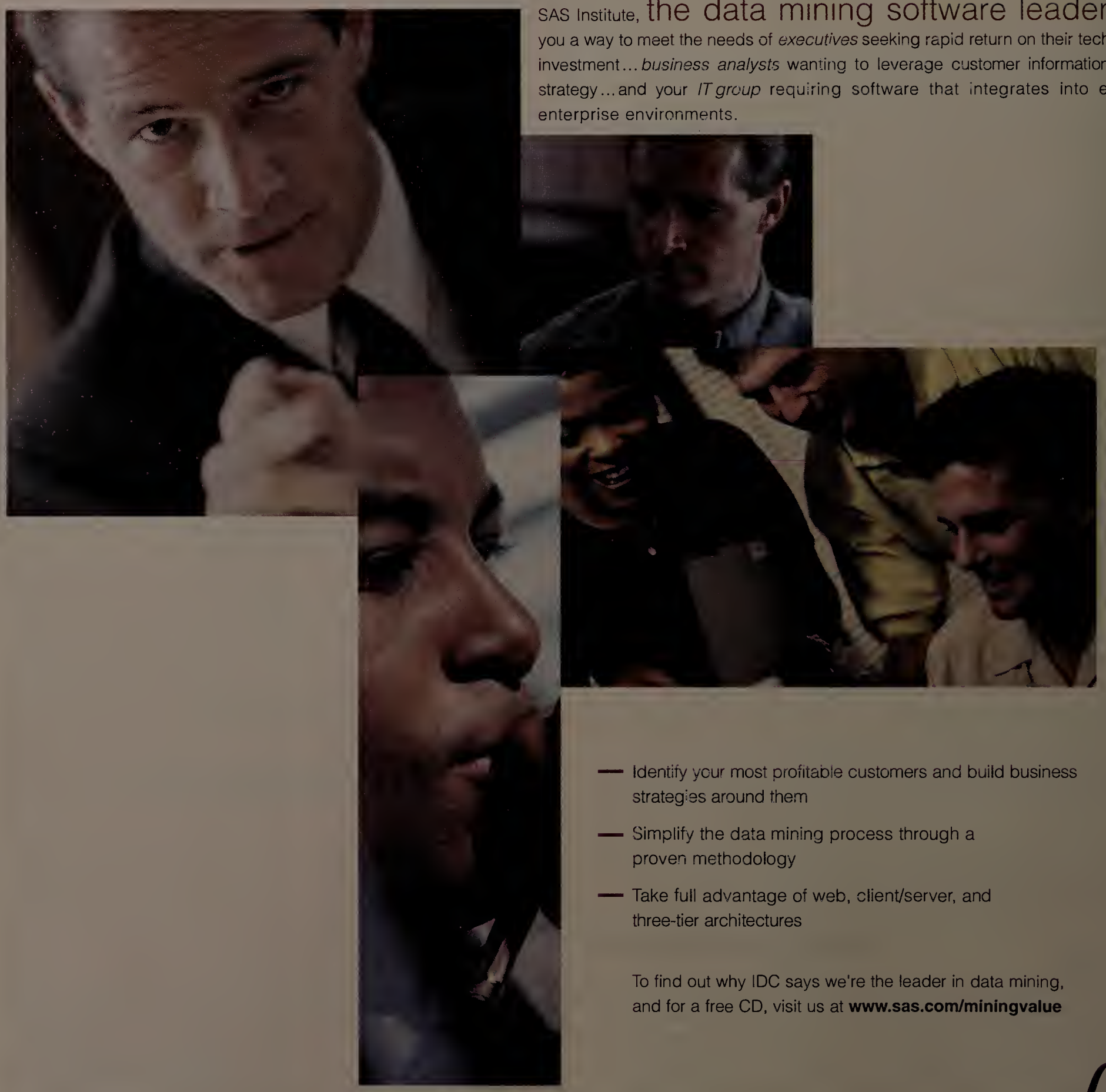

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Handheld Software Cheered

Joint product will help firms manage devices

BY DOMINIQUE DECKMYN

ANALYSTS AND USERS welcome the plans of Puma Technology Inc. in San Jose and Sterling Commerce Inc. in Dublin, Ohio, to provide software that will help companies manage handheld devices.

Puma provides synchronization tools for Palm Computing Inc.'s Palm and handhelds based on Microsoft Corp.'s Windows CE. The firm's Intellisync Anywhere software will be combined with Sterling's Connect:Manage, which manages mobile PCs and handhelds.

The combined product, Enterprise Intellisync, will ship in the first quarter of 2000 and is priced at about $50 per seat. It will include centrally configured synchronization of handheld devices, software deployment and diagnostics.

"One of our big concerns is the cost of managing these devices," said David Gruver, a technical director at SBC Communications Inc. in San Ramon, Calif., who is faced with a rapidly growing base of about 2,000 handhelds.

Centralized management of handheld devices isn't such a priority when they're being used mainly as personal information managers, said Gruver. "But if we start to deliver more content to these devices, then [management] becomes more critical." The company now requires personnel to use Palm devices with personal, desktop-based synchronization software from Puma.

"It's a good statement of direction," said Ken Dulaney, an analyst at Gartner Group Inc. in San Jose. Dulaney said it is unclear whether Puma and Sterling can merge their respective platforms. But if they do, he said, the features of the merged platform would make it easier to manage handheld devices than with any currently available products. "What we don't want to see is patchwork," said Dulaney. A recent Gartner report found that the total cost of ownership for a handheld is $2,700. But Gruver said that number is probably too high. ◗

Hidden Costs

The handheld devices that have crept into corporate America pose a management problem, according to a recent study:

- The total annual cost of owning and supporting a handheld computer is about $2,700.
- 40% of that cost is for time spent synchronizing the device.

SOURCE: GARTNER GROUP INC., STAMFORD, CONN

Windows Devices Get Full-Size Apps

BY DOMINIQUE DECKMYN

Citrix Systems Inc. is squeezing full-size Windows applications onto palm-size PCs running Windows CE.

The Fort Lauderdale, Fla., company has released new client software based on its Independent Computing Architecture (ICA). It will allow palm-size PCs to access any Windows application running on a Windows NT server equipped with Citrix's MetaFrame multiuser Windows software. Citrix said the software will run on any Windows CE palm-size PC or handheld PC, regardless of processor.

Restricted View

The ICA client will display only part of a full-screen Windows application at any time, so users will have to scroll through the screen to see the rest.

"It's like looking through a keyhole," said Greg Blatnik, managing director at Redwood City, Calif.-based, research firm Zona Research Inc. In some situations, Blatnik said, the only alternative is to develop custom handheld applications to access certain data. "If you can get access to a wide range of familiar applications through these handhelds, that can be useful," Blatnik said.

The software will let users cut and paste from Windows applications to local Windows CE applications.

Citrix said it has no plans to offer a similar ICA client for Palm Computing Inc.'s Palm OS. ◗

Wireless Portal

Zap Business Communication Systems Inc. in San Jose says it's the first firm to open its platform to wireless phones.

Zap released an update of its ucOne corporate portal, which adds support for the Wireless Application Protocol and for Palm Computing's Palm VII. UcOne includes custom news feeds and discussion groups. Pricing starts at $5,000 for a 50-user license.

Joshua Walker, an analyst at Forrester Research Inc. in Cambridge, Mass., called the idea of a wireless portal premature, because few firms are far enough along in their portal plans to extend them to wireless devices. "It is still more practical to take [individual] applications wireless," Walker said.

Vendors extending intranet applications to wireless devices include AvantGo Inc. in San Mateo, Calif., which launched a small-business version of its AvantGo Server. The new AvantGo Enterprise Publisher is priced at $75 per user. – *Dominique Deckmyn*

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BRIEFS

Nortel Acquires Qtera

Nortel Networks in Brampton, Ontario, last week said it has paid $3.25 billion in stock to buy Boca Raton, Fla.-based Qtera Corp., a privately held maker of long-reach optical networking systems. Nortel said it made the purchase to gain cutting-edge optical technology for improved Internet performance and for economic reasons.

Ariba Buys Tradex

Mountain View, Calif.-based Ariba Inc. last week agreed to buy Tradex Technologies Inc., an Atlanta-based online trading platform company, for $1.86 billion in stock. The deal allows Ariba to expand its role to become an online aggregator of goods and services for certain communities.

Storage for Seagate

Seagate Technology Inc. has signed an agreement to buy Eden Prairie, Minn.-based XIOtech Corp., a provider of virtual storage and storage-area network products, for approximately $360 million in common stock. Scotts Valley, Calif.-based Seagate makes computer disk drives.

Telecom Spending Up

Spending on telecommunications increased 11.4% from last year to this year, generating revenues of $517.6 billion, according to a report by the Telecommunications Industry Association in Washington and the MultiMedia Telecommunications Association in Arlington, Va.

The fastest-growing market category was hardware and software for computer/telephone integration, according to the report. Spending in that arena increased 66.2% over last year.

Renaming at Cabletron

Cabletron Systems Inc.'s management software business unit is changing its name from Spectrum to Aprisma Management Technologies. Company officials wanted to avoid confusion between the company and its flagship network management software, also called Spectrum, a company spokeswoman said.

SAN Data Sharing Closer for Tivoli Users

Tivoli parent IBM buys storage unit of Mercury Computer Systems for $23.5M

BY SAMI LAIS

USERS of Tivoli Systems Inc.'s storage software who were promised more extensive data-sharing capabilities by 2001 will get an early delivery on that promise.

Tivoli parent IBM announced last week that it's buying Mercury Computer Systems Inc.'s Shared Storage Business Unit for $23.5 million.

The sale includes the unit's SANergy software, which allows data sharing across multiple platforms within a storage-area network (SAN).

SANergy was pretty much the last SAN file-system product on the market, said Robert Gray, a SAN analyst at International Data Corp. in Framingham, Mass.

In May, Hewlett-Packard Co. bought Transoft Networks Inc. in Santa Barbara, Calif. And Advanced Digital Information Corp. in Redmond, Wash., bought MountainGate Imaging Systems Inc. in Reno, Nev., in September.

A Base to Build On

IBM's purchase makes it more competitive in the SAN market and provides "a base on which IBM can continue development," Gray said.

Austin, Texas-based Tivoli is touting the capability it will gain in the deal for use in data-intensive electronic business applications.

Chelmsford, Mass.-based Mercury had been on the verge of releasing disk-sharing features for SANergy, said Tivoli storage strategist Troy Pladson. Those features will be released next year under the Tivoli brand, he said.

Mercury is best known for its embedded, real-time digital signal and image processing systems, which transform sensor data for analysis and interpretation, primarily in medical diagnostic devices and military imaging applications.

When Mercury four years ago began developing the product that became SANergy, it was with an eye toward taking the company's multiprocessing hardware into the digital video market, said Barry Burke, Mercury vice president and general manager.

Developers found that the bigger problem was data storage, he said. Their work changed course to focus first on data sharing for digital video and then on a more general market.

At $23.5 million, the sale represents some "good negotiating" by IBM, Gray said, "and something of a missed opportunity for Mercury," although the company had never made SANs its primary business.

JUST THE FACTS

Utilizing SANergy

Mercury Computer Systems' Shared Storage Business Unit:

Headquarters: Chelmsford, Mass.

Sold for: $23.5 million to IBM.

Product: SANergy allows dynamic, cross-platform data sharing on any storage-area network, from any system on the network.

Future: IBM will rebrand SANergy, add it to Tivoli's storage software tool set and continue development. Disk-sharing features will be added next year.

Candle Sets Sights on Web

Reorg includes an e-business group

BY SAMI LAIS

Candle Corp.'s announcements this month of new divisions are part of a reorganization and sharpening of focus on managing the enterprise for the Web.

The surprise might be that it took Santa Monica, Calif.-based Candle so long.

Since he founded Candle in 1976, Chairman and CEO Aubrey Chernick has moved the company along a narrow and measured path.

"Before [Chernick] makes a move, he thinks it through to make sure his technology can support what the business wants to do," said Richard Ptak, an analyst at Hurwitz Group Inc. in Framingham, Mass.

A middleware maker, Candle has software tools for performance measurement, network and systems administration and, most recently, Web site management and performance monitoring.

The company competes with niche vendors and, for some products, with software giants Computer Associates International Inc. in Islandia, N.Y., BMC Software Inc. in Houston and IBM.

For the past 18 to 24 months, Candle has been its own guinea pig for its "more holistic view" of Web and system management, said a Candle spokesman.

As part of the reorganization, the company created an E-Business Computing Group that will devote itself to business-to-business e-commerce. The newly realigned Enterprise Computing Group will focus on system, application and middleware management.

Candle has brought in Steve Kiser, a 27-year Xerox Corp. veteran and former CEO of Xerox subsidiary Chrystal Software, as head strategist. Kiser called the reorganization "very much a companywide makeover."

Candle, which is privately held, reported 1998 revenue of $361 million.

Portal's Next For Sybase

BY ROBIN ROBINSON

Recovering database vendor Sybase Inc. continues its focus on the Web with its upcoming enterprise portal architecture, OpenDoor.

Enterprise portals — this year's buzzword — are personalized views into multiple, back-end data sources.

"It's an intelligent direction for Sybase to go in, given they've run into rough waters in their database sector," said Dwight Davis, an analyst at Summit Strategies Inc., which is based in Kirkland, Wash.

"Sybase has always had good technology, but competitors — Oracle, IBM and Microsoft — have marginalized them as a 'vendor on the ropes' in the enterprise database sector," Davis said.

For the most recent quarter, Sybase posted income of $16 million, up from $2.2 million a year ago. Its revenue has hovered on the upside of $200 million each quarter for the past two years while it focused on recovering its profits. The company posted losses and laid people off in 1997 and 1998.

The goal of OpenDoor is to unify the mix of disparate databases that companies tend to collect, either by design or through business acquisitions, said Bob Breton, senior director of product management in Sybase's enterprise division.

"We're trying to create a very open platform, connecting to IBM or Oracle, and from the Web," he said.

Davis said Sybase is jumping into a crowded portal market, but it has experience with corporate users and their need for around-the-clock uptime.

Another analyst sees Sybase as the only database vendor offering a portal able to run on any of the major databases.

"Sybase is approaching from more of a database-agnostic perspective," said Phil Costa, an analyst at Giga Information Group Inc. in Cambridge, Mass.

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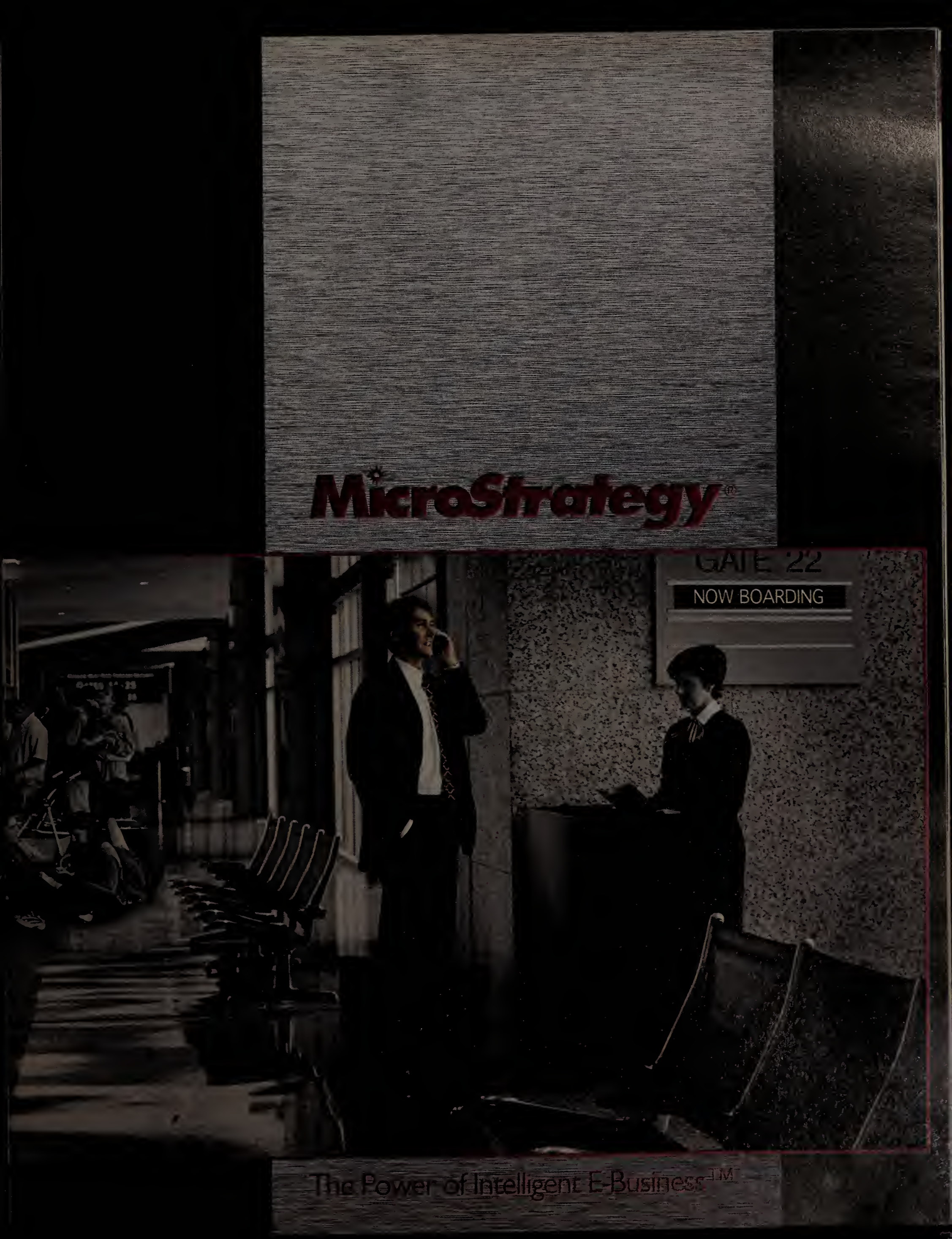
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MARYFRAN JOHNSON

End of (Y2K) days

SO HERE IT COMES: the final countdown. The last 12 days till Y2K. Never in the history of information technology has one programming misstep cost so much and involved so many — or generated so much ink and attention.

Estimates of the worldwide cost to fix the Y2K bug range from a relatively modest $300 billion to more than $1 trillion. The U.S. Department of Commerce says America alone spent at least $100 billion on Y2K projects during the past few years, or roughly $365 per man, woman and child. In one survey, Gartner Group found that larger companies earmarked at least 44% of their IT budgets for Y2K this year, with the average corporate bill running around $6.6 million for date-conversion efforts.

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at **maryfran_johnson@computerworld.com.**

Oddly enough, this turned out to be a blessing disguised as a curse. In the roiling wake of the Y2K crisis, the high-tech staffing shortage and the rapid rise of e-commerce, the connections forged between IT and the business side have never been stronger. Dealing with Y2K has forever changed the way senior management views the strategic role of technology.

So here it comes, the long-awaited alignment of business and IT.

We've always felt a strong kinship with the IT folks working on Y2K projects. In 1984, *Computerworld* published the first story ever about it, and nine years later in these pages, consultant Peter de Jager's "Doomsday 2000" article (Sept. 6, 1993) issued the first call to arms for the IT community. Then, in early 1998, we began an in-depth series called the Y2K Chronicles, which tracked six user companies through every phase of their Y2K projects. The penultimate chapter of that series is on this week's front page, with a postscript to follow in early January.

And for the tens of thousands of IT professionals on duty New Year's Eve, *Computerworld* will be there with you, once again. Starting Dec. 27, our Web site (*www.computerworld.com*) will feature a special "Y2K Watch." We'll supply everything from breaking news and international reports from many of the 55 *Computerworlds* around the world, to user forums, resource links, Y2K stats and tidbits — even a lighthearted take on it all from cartoonist John Klossner.

So here it comes, the end of Y2K days. We'll see you on the other side. ◗

DON TAPSCOTT

WAP is the wave of the Web's future

SURE, your company is on the Web, but is it WAPed?

ABC News is. So are Yahoo and Bloomberg.

These companies are early movers in what will soon be a stampede of Web content providers wanting to make sure their information remains intelligible when squeezed onto the small screens of mobile phones, personal digital assistants and other wireless devices.

The great news for digital economy strategists is that almost all of the world's major players in the wireless market have agreed on an open standard for configuring and transmitting information. The set of technical specifications, known as the Wireless Application Protocol, or WAP, guides the wireless-phone manufacturers, network operators, content creators and application developers.

DON TAPSCOTT is chairman of the Alliance for Converging Technologies. Contact him at **column@tapscott.com.**

The result is that the Internet's interoperability standards we expect on our desktop computers are available on our wireless devices. A mini-Web page looks the same on a phone in Paris or Melbourne as it does in New York.

Some pundits argue that the recent Microsoft-Ericsson alliance is intended to create a proprietary standard that will undermine WAP. Hesitant companies may use this alleged uncertainty as a reason to delay generating WAP content. That's the wrong decision. WAP will prevail. The Internet has shown that vendor-neutral standards for communication protocols are the future.

If your Web site continues to presume the consumer is sitting at a desktop PC with a quick connection and large screen, you're missing out on what will soon be the fastest-growing segment of the market.

Handheld devices will eclipse PCs as the dominant Internet access devices. The world's largest mobile phone maker, Finland's Nokia, expects more than 1 billion mobile phones to be in use by the end of 2002. By 2003, more than 600 million phones will access the Internet, compared with only 550 million PCs.

Which is why Amazon.com just announced a partnership with Sprint to make a mini-Amazon Web site available on Sprint PCS phones. "We want shopping to be the easiest thing our customers do this holiday season," says Jeff Bezos, Amazon.com's founder and CEO. Making books,

videos and toys available on mobile phones "continues to expand how our customers find, discover and buy anything online — at any time, from anywhere."

Obviously, some Web content, such as e-mail, stock prices, headlines and travel information, will be particularly relevant for wireless users.

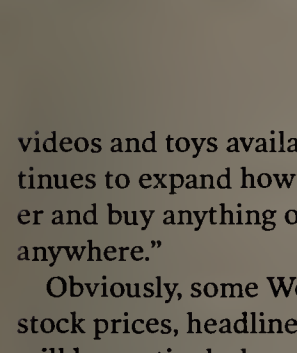
WAP-enabled mobile phones are just coming on to the market, leaving companies with a classic chicken-and-egg dilemma: Should they spend money to develop a WAP presence now, or wait until there's a higher critical mass of users?

As the Internet has shown so many times already, those who hesitate will be pummeled. ◗

DAVID MOSCHELLA

Ten key IT challenges for the next 20 years

AS HAS OFTEN BEEN NOTED, one of the stranger things about the fast-approaching millennium is our almost total inability to see or talk past it. Way back in the 1960s, people were wondering what life in the year 2000 would be like. Yet, as the decades rolled by, our societal horizon somehow hardly budged, and now the whole Y2K issue seems to have shrunk much of our vision down to just a few short weeks. Amazingly, we still don't have a way to even pronounce the coming decade of the '00s.



DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at **dmoschella@earthlink.net.**

That's at least one reason to look forward to 1/1/00. It will finally force us to face the future that's rapidly racing toward us. Toward that end, here's my list of what I think will be 10 of the most decisive IT industry challenges of the next 10 to 20 years. Consider them long-term issues worth monitoring.

Putting the physical world online. The early years of the Web have been dominated by people, screens and keyboards, but the next great wave will involve cars, appliances, houses, cameras, sensors, plants, genes, the human body and most of the rest of the nondigital world. Indeed, the integration of the physical world with our increasingly ubiquitous network infrastructures could easily lead to even greater societal changes than those we are experiencing today.

National infrastructures. Developed and developing countries all around the world are now essentially in a race to build advanced, high-bandwidth telecommunications infrastructures. Which nation will get there first? How much will it matter? What would happen if the U.S. wound up trailing badly? One thing is for sure: Some countries are moving much faster than others.

Globalization. Since the end of the Cold War, the world has been rushing toward ever-higher levels of national convergence, with capital markets, business regulation, trade policies and the like becoming increasingly similar. This homogenization is particularly important to the expansion of the Internet. Despite the recent anti-World Trade Organization protests in Seattle, the current faith in global markets is unlikely to unravel unless the world suffers a prolonged economic downturn.

Societal equity. Although the Internet has clearly helped accelerate the growth of the U.S. economy, there is little doubt that it has also widened America's already world-leading income disparities. If this trend isn't reversed, or at least stemmed, some sort of backlash is all but inevitable. Unfortunately, given the winner-take-all nature of many technology businesses, further widening seems almost certain, unless, of course, the stock market crashes.

Intellectual property. Although we often think that intellectual property protection is inherently desirable, there is such a thing as too much protection. Thanks mostly to large campaign donations and other forms of corporate lobbying, patents are now being steadily extended into all sorts of dubious areas, including Internet processes, food types, seeds and even genes. Similarly, copyright protection terms have become ridiculously long, given today's fast-moving world. Resentment in the developing world is steadily building and will be increasingly seen as justified.

To round out the top 10, I would add the Internet's contribution to the increasing dominance of English among world languages; the protection of individual privacy, especially for medical and financial information; the risks and benefits of a completely online political process; possible international resistance to America's software and Internet hegemony; and, finally, the wild-card threats to our industry from hackers, terrorists or even war.

That's plenty to think about once we get past the next two weeks. ◗

READERS' LETTERS

H-1B recalculation reveals INS errors

THE ARTICLE "Getting in on H-1B" [Business, Nov. 8] lists the "Top 20 Companies Employing H-1B Workers," according to the Immigration and Naturalization Service, and purports that these companies use approximately 60% of H-1Bs. These statistics are inaccurate. When the figures were released in June, we surveyed the companies and found the INS overestimated H-1B usage by 200% to 700% per company.

In a July meeting with INS representatives to clarify the inaccuracies, they informed us they had drawn the numbers from a "different pool" than the 65,000 fiscal 1998 cap. While not a satisfactory response, we requested they recalculate and issue corrected data. This has not happened.

Given the grossly inaccurate INS statistics, it is not true that 20 companies consume 60% of the available H-1B visas. Instead, the H-1B program is used by a full range of U.S. companies, nonprofit entities and even the public sector. H-1B workers benefit every part of our economy — not only the IT sector.

Renee Winsky
Information Technology Association of America
Arlington, Va.

Lynn Shotwell
American Council on International Personnel Inc.
Washington

Industry at fault for ERP stumbles

IN THE Nov. 1 and Nov. 8 issues of *Computerworld*, I read with some amazement about the trials and tribulations of Hershey Foods Corp. and Whirlpool Corp. regarding failed system implementations. What surprises me was not the fact that these companies failed the implementation phase of major projects but that there aren't more stories like them.

Companies seem to have adopted a Microsoft approach to systems implementation: If the system is 60% to 80% ready and you must make a deadline, throw it out to the masses and have the users tell you what remaining problems exist.

James M. Tennyson Jr.
Vice president, CIO
MenuDirect Corp.
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Y2K hype is a disservice to readers

ED YOURDON writes that he has received a lot of mail from would-be Y2K whistle-blowers ["Y2K Whistle-Blowers," Business Opinion, Nov. 15], but not a single case of a Y2K whistle-blower has been published.

If Yourdon knows of so many whistle-blowers, then the real story is why he is keeping them all secret.

Computerworld should publish honest, fact-based journalism, not more hyped Y2K sensationalism.

Frank J. Stech
Annapolis, Md.

Survey offered system help

I REALLY enjoyed "Compaq Takes A Hit: Server Satisfaction Poll" [Technology, Nov. 22]. Our company, Reinsurance Group of America, is starting to evaluate hardware platforms and operating systems for use as our Oracle database server. We currently use Compaq Alpha 4100s running OpenVMS. We're looking at moving to Unix and possibly a different hardware platform.

Thank you for your efforts.

Joe Profaizer
Reinsurance Group of America Inc.
Chesterfield, Mo.
jprofaizer@rgare.com

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Include an address and phone number for immediate verification. Internet: letters@computerworld.com

intel inside

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JOHN GANTZ

The more things change in IT . . .

WOW, MY LAST COLUMN of the millennium! Believe it or not, I have been an analyst for 2.5% of that 1,000-year span.

During my little wedge of the millennium, I have discovered that there are some time-honored constants about the information technology profession — old chestnuts that I wrote about 25 years ago that I'm still writing about today. I suspect they'll still be true in Y3K. Here's a sample:

IT professionals can never have enough presentation skills or powers of persuasion. Selling and internal public relations don't seem to come easily to most IT professionals, yet they're the top success factors for career advancement.

JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at **jgantz@idcresearch.com.**

They were the most important skills 25 years ago when I surveyed MIS managers about successful distributed-processing rollouts, and they were still on top last year in an informal poll of CIOs at a conference.

In the electronic-business millennium, those skills will be as important as ever. There will be room in the industry for the programmer-recluse, but in some technical specialty or off in a corner debugging Java scripts, not on the corporate ladder.

Making an IT organization "service-oriented" will always be a struggle. Most IT professionals seem to like the work itself — the puzzle-solving aspect of working with complex software systems — but not necessarily the customers.

Those who like constant interpersonal interactions — such as salespeople, account reps and marketing types — would probably consider life as a programmer akin to solitary confinement.

Building an outward-facing organization from a collection of inward-facing individuals is no easy task. Companies need to understand this and give their CIOs tools that can help.

The IT shop will always be somewhat of a black hole. Work will go into queues and never come out, deadlines will slip, and the work of an IT professional will be mysterious to outsiders.

Some of the reason for this relates to the point that programmers aren't born communicators, but more so to the fact that non-IT professionals never seem to understand the complexity of the systems that are now so "easy to use." That lack of understanding leads to unrealistic expectations and overloaded IT departments.

Systems designers and end users will always live on different planets. This is one of those immutable laws of nature.

By the time any one individual has the knowledge and skills to write a complex software system, he — or the organization — will no longer be capable of understanding how little end users really know, or want to know, about the underlying technology.

This phenomenon affects other engineering disciplines as well, as witnessed by the number of features you don't use on your VCR and your cell phone.

We will never have enough memory or processing power. From back when a megabyte of IBM mainframe memory cost hundreds of thousands of dollars, IT managers and those funding them have always underestimated the speed with which memory and processing power get used up.

In fact, I have *never* met an IT professional who admitted to overbuying memory, storage or processing power. "Capacity planning" should be renamed "shortage management."

But one thing has changed, and that is the regard in which the profession is held. Businesses and society see the fruits of IT professionals' labor every day now. Words like *technocrat* are out; *professional* is in. So we've made progress since my first column. I expect even more in the next 25 years or, for that matter, the next 1,000. ◗

STEPHEN COBB

Don't fall victim to year 2000 false alarms

FORTUNATELY, there's still time to protect against a major problem that IT managers will face on Jan. 1: false alarms. The following scenario isn't hard to imagine, particularly if you've been involved in system security, where distinguishing false alarms from genuine security breaches is a big part of the job:

STEPHEN COBB, a certified information systems security professional based in Fairfax, Va., is director of research and training at Spectria InfoSec Labs. Contact him at **scobb@infoseclabs.com.**

One of your night-shift operators is waiting for a backup to complete, so he starts browsing through the server farm. Some unusual files on an e-commerce Web server catch his eye. He alerts a colleague, but she can't explain the files either. She starts checking the logs and sees traffic that she's never seen before on the network. They decide to page the system manager. He rushes in, by which time the night shift has found several more anomalies that can't be accounted for, although it immediately occurs to the system manager that this could explain some mysterious recent server crashes. It's clearly time to act. A general alert is sounded: There may be hackers in the system.

Fast-forward five days to the final diagnosis: There were no hackers in the system. The strange files were left over from testing. Nobody had noticed the files until they were questioned by a bored operator with time on his hands. The unusual traffic was legitimate, but not observed before because the current configuration was only a few weeks old and still somewhat unstable.

No big deal? Perhaps, except for $100,000 in consultants' fees and unbudgeted overtime, plus the painful meeting with the CEO to explain how taking the servers down for a six-hour emergency rebuild, during which an estimated $200,000 in electronic business was lost to the competition, wasn't really necessary.

Clearly, a false alarm like this, which is based on an actual incident witnessed earlier this year, has the potential to cost your organization a lot of money. What you need to think about right now is the potential for people who are scrutinizing your systems to generate false alarms. If you're responsible for Y2K readiness, a panic attack could damage your credibility much more than a genuine problem, where there might be a chance to gain kudos for your handling of the crisis.

Fortunately, you still have some time to institute the single most important Y2K-crisis prevention strategy: Know your systems! Unless you and your staff know what the system looks like on a good day (or night), you will have a hard time telling "strange" from normal. Now is the time to make sure your network diagrams are accurate, your log analysis is up-to-date and your people know what legitimate traffic looks like — not just on an average weekday, but also on weekends, month-ends, quarter- and year-ends and any other periodic cycle.

Several other factors may be on your side. You may have frozen systems, which will make it easier to learn and keep track of what "normal" looks like. You may have booked extra staff to watch over systems during late December and early January. That's wise, but it's a potential problem if these people aren't intimately familiar with the systems they're watching.

In the incident alluded to earlier, having a whole gaggle of people speculate about a system was found to be an expensive impediment to a speedy, accurate diagnosis.

It's better to go for quality of coverage, not quantity. Make sure that the people who put the system together are either there, within easy reach or at least identified and documented. New Year's Day 2000 isn't going to be a good time to ask "Who was that guy who patched this server?" Remember, the goal is to be able to rely on the answer you get when you or someone on your staff asks: "Does this look right to you?" ◗

BUSINESS

Y2K CONFIDENCE

Nearly all of the IT managers contacted for *Computerworld*'s quarterly Y2K confidence survey said their systems will be ready to handle the date change. And there was a big increase in confidence that their customers and suppliers will also be ready. Many are predicting that any problems that arise will be minor ones. ▸ 36

SERVICE FOCUS

Lands' End sells more apparel online than any other online retailer. How? Good customer service. By leveraging its existing top-notch customer service and using new online services, Lands' End is moving customers to the Web. It's a move that could eventually cut out its heftiest expense: the $201 million spent annually in catalog production and mailing costs. ▸ 38

TESTING INTO JANUARY

Not all Y2K problems will surface on Jan. 1. It may take a few weeks for some of them to crop up, says Ed Yourdon. He advises avoiding trouble by keeping in touch with suppliers, customers and business partners to see if they're having problems. And, continue testing after Jan. 1. ▸ 39

Y2K CHRONICLES

The six companies *Computerworld* has followed through two years of Y2K remediation say their systems are ready. But that hasn't stopped them from coming up with and putting into place contingency plans to handle everything from a bank run to a riot. ▸ 42

Y2K CHECKLIST

Rather than sweating the details when it comes to the final hour before Y2K, make a checklist to keep things on track. Backup communication plans, an up-to-date phone list, a last-minute check of call-in capabilities and a plan for implementing manual processes can help ward off disaster. ▸ 46

TCO OPTIONS

Though using a total cost of ownership (TCO) analysis model promises to lower costs and increase the benefits of IT, 78% of all IT administrators say they don't track TCO, according to a study by Forrester Research. To gain companywide acceptance and compliance, buy-in from a top-level executive is vital. See QuickStudy. ▸ 52

MATCHING WORDS

Joe Auer says he's seen companies spend thousands of dollars in court arguing over the meaning of individual words in a contract. In his opinion, a good contract for both parties is a document that's so clear, a disinterested third party of average intelligence could read it and, without coaching, completely understand it. ▸ 53

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ALAN LEVENSON

DARRELL BEGAY spent his youth herding cattle, but then he took a computer class and "never looked back." Now he's pursuing a degree in computer science

THE NEGLECTED WORKFORCE

DARRELL BEGAY (pictured above) is part of a movement to bring technology to American Indians. Despite a 4% U.S. unemployment rate, many of the estimated 2.4 million American Indians have no work at all. Meanwhile, IT managers are hiring increasing numbers of foreign workers under H-1B visas. New educational initiatives hope to bring technology and training to reservations.

48

Windows 2000

What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Microsoft ratchets up security features with Windows 2000

Closer Look: In the increasingly important area of computer security, Windows 2000 offers something to just about everyone in the enterprise. Hard disk encryption — a big boon for laptop users — and smart-card support are just two of the reasons Windows 2000 is more secure than Windows NT.

Industry Insights: Making Unix and NT work together

It's been said repeatedly that making Unix and Windows NT work together is nearly impossible, that these two server operating environments just can't interoperate harmoniously. "Hogwash," says our columnist Dan Kusnetzky. These two seemingly disparate software environments can be exploited simultaneously in many ways.

Microsoft consultant stresses Windows 2000 lab work

Take it from a consultant who has been working on enterprise Windows 2000 implementations for the better part of two years: The benefits are bountiful, but prior to implementing it in a production environment, it is necessary to test the system thoroughly in a lab environment, followed by a pilot project.

Quickpoll **Will the new remote monitoring and access features of Windows 2000 be valuable to your company?**

Cast your vote now at www.Windows2000Advantage.com.

Microsoft

COMPUTERWORLD

Windows 2000 IT training: No pain, no gain

By Steve Alexander

Training Windows 2000 users is a daunting task. Active Directory is a powerful, but unfamiliar technology. There are new and improved security features. And deploying applications using Windows 2000 Server requires new skills. In essence, IT trainers have to teach an entirely new way of looking at networks.

Active Directory is probably the biggest challenge because it requires network administrators — many of whom aren't used to working with directories — to make the biggest changes in their workstyles. This key piece of Windows 2000 comprises a directory service that enables distributed security and administration.

"Active Directory is the central piece in Windows 2000," says Dawn Smith, practice manager in charge of Windows 2000 training at Information Management Group Inc., a third-party training firm based in Chicago. "While there is a security accounts manager in Windows NT 4.0, Active Directory is 1,000 times more powerful."

Kevin Murray agrees. According to him, Windows 2000 is 80% to 90% different from Windows NT 4.0, and a large part of that difference is in Active Directory. Murray is a North Carolina-based product manager for Microsoft training at Global Knowledge Network Inc., a third-party training firm based in Burlington, Mass.

Sergio Pineda, Microsoft's lead product manager for the company's business and enterprise division training group, sees two key audiences for training. There are those who don't know the details of Windows NT and those who are experienced in Windows NT but need to learn how Windows 2000 affects network planning issues. For the latter, key teaching issues include Active Directory, security, deploying applications on the desktop, managing users and setting up Web services, he says.

Who will need to learn about Active Directory? It depends on the networking decisions a company makes.

"Active Directory is a great way for IT administrators to manage users, resources and data, improve security and extend interoperability across the entire network," Pineda says. "In some cases Active Directory will get deployed right away, and in other instances it won't get deployed immediately. For example, a customer may integrate Windows 2000 Server into an existing network to set up Web services or file and print services. But to reap the full benefits of Windows 2000, customers will need to get educated on how to deploy Active Directory." ◗

To read the full text of this story, visit www.Windows2000Advantage.com.

ADVANTAGE

The Web Magazine for IT Leaders Implementing Windows NT and Windows 2000 with Compaq Services and Solutions

▸Q&A

Compaq exec talks about Win 2000 — from a user perspective

Tony Redmond, Compaq's director of applied Microsoft technology group, has been deeply involved with Windows 2000 training for internal Compaq consultants. His "Dream Team" of consultants recently presided over the Windows 2000 Academy in San Diego, where technical representatives from 100 of Compaq's largest customers gathered for an intensive, week-long Windows 2000 training course. Windows 2000 Advantage's Stefanie McCann talked with Redmond about the challenges faced by companies implementing Windows 2000.

Q: How much Windows 2000 knowledge do customers have right now?

Redmond: When customers start their deployment they're going to start off at base zero in terms of knowledge. If you were going to go find knowledge, where would you go? You would go to the people who have the knowledge. We have the knowledge because of Compaq's own implementation process and because of the relationship we have with Microsoft.

Q: How long do you think it will take users to deploy Windows 2000?

Redmond: It depends on their knowledge. Compaq could deploy today, but does everyone have the knowledge that Compaq has? No, they don't. So they have to go through knowledge acquisition. We have a lot of sources. So that's what has helped us to move much further along the line.

Q: How long do you think customers are going to wait before deploying Windows 2000?

Redmond: We're running it — it works, but knowledge is the key. Clearly, if you don't have any knowledge about it and you look at Windows 2000, you're going to say, "Wow! There's so much technology shift here, I can't deal with it, I'd better wait." From that perspective, it's good advice. From our perspective, because we have the knowledge, we'd do it tomorrow. I think that about 20% of our customers here at the Windows 2000 Academy are going to be ready to rock and roll very early in 2000. There are probably another 40% who are going to wait until the end of 2000. And there are others who are going to wait even longer because they don't have the knowledge or they have other pressing application needs. ◗

To read the full text of this interview, visit www.Windows2000Advantage.com.

"I think that about 20% of our customers here at the Windows 2000 Academy are going to be ready to rock and roll very early in 2000."

— Tony Redmond, Compaq's director of applied Microsoft technology group

www.Windows2000Advantage.com

Point of View

Users say Compaq's DISA key to electronic commerce

By Elisabeth Putnam

As more and more companies expand their Web sites beyond marketing and customer support to transaction-based e-business, IT departments are coping with unprecedented demands on the underlying hardware and software platforms. These organizations are finding they need highly scalable, virtually nonstop systems to successfully conduct e-business on the Web.

"The first phase of e-business was primarily a battle of eyeballs, getting people to the site," says Mark Linesch, director of e-commerce enterprise solutions at Compaq. "Now sites are moving to the next phase, involving real business transactions. It's about competitive advantage, end-to-end business systems that include your suppliers and your customers, and mission-critical applications that deliver competitive advantage."

Ron Rose, CIO at Priceline.com, can attest to that. The Web-based company enables customers to decide what price they want to pay for items like cars and airline tickets and then submit the bid to vendors. Price.com's unique way of matching buyers and sellers took off last year, and gets in 1.5 million site visits per day.

"The Priceline e-commerce model requires the highest data availability for our customers, and we are certainly a 24/7 shop," says Rose.

Working with customers like Priceline.com, Compaq developed Distributed Internet Server Array (DISA), a blueprint and set of best practices for building industrial-strength e-business platforms.

DISA uses a multitier architecture and redundant, clustered servers to eliminate single points of failure. It also ensures nonstop performance and provides the ability to scale up without interrupting operations. On the front end, clusters or arrays of application and Web servers process HTTP requests and transactions. An IP load balancer performs intelligent load balancing to ensure performance and response time. On the back end, data resource servers provide centralized, high-availability repositories for critical application data and content. DISA recommends using a clustering technology such as Microsoft's Cluster Services to ensure redundancy and reliability. ◗

For more inside, hands-on Windows 2000 information, go to

GO

Y2K Survey Reveals Growing Confidence in IT Readiness

IT managers highly confident of success, especially among suppliers and customers

BY RICK SAIA

After several years of alarms, warnings, prophecies and urgings, information technology managers appear to have one final message in the remaining days before 2000: Bring on Y2K!

Nearly all IT managers contacted this month for *Computerworld*'s quarterly Y2K confidence survey said their firms' information systems will be ready to handle the date change come Jan. 1. Estimations of their own readiness hit an all-time high of 4.8 out of a possible 5. But more significant was a huge rise in confidence among these IT managers that their customers and suppliers will make it also.

Asked to rate their confidence in their business partners' compliance on a scale of 1 (not at all confident) to 5 (extremely confident), the mean answer moved up from about 3.95 in a September survey to about 4.06 this month.

Supply-chain confidence has increased steadily since *Computerworld* conducted its first Y2K confidence survey in September 1998.

"My people here aren't worried," said Steven Greenwood, MIS director at Newpro Inc., a Woburn, Mass.-based seller of home windows. Greenwood said he has been assured that his company's supplier of raw materials — a foreign firm — will be year 2000 compliant.

Such news is music to the ears of Peter de Jager, the Y2K expert credited with having sounded the call on the Y2K problem with his 1993 *Computerworld* column "Doomsday."

"I honestly believe there is reason to be more confident than we were before," de Jager said. "A lot of the ranting and raving by myself and many others [was] because we weren't doing anything."

But apparently, a lot of work has been taking place since the first confidence survey in 1998:

- In October 1998, less than 8% of firms surveyed said their systems were fully compliant.

Today, that number is around 60%. Another 37% said 90% to 99% of their systems are ready.

- In those 14 months, the percentage of respondents who believed Y2K would cause significant economic problems in the U.S. gradually fell to just 5% this month, from about 34%.
- The percentage who foresee only a minor impact rose steadily from 7% in September 1998 to 36% this month. The majority of the 265 IT managers surveyed this month — 54% — see spot problems. Another 5% see no impact at all.

"I think that there may be pockets of minor annoyances, but overall I don't think there's going to be a big problem," said David C. Eakin, director of client/server systems at the U.S. Navy's Naval Inventory Control Point in Mechanicsburg, Pa.

But to ensure they'll continue operating, 78% of the firms surveyed have, or plan to have, contingency plans in place.

"I think we're going to be in good shape," added Michael Rizzo, manager of data processing at Gold Medal Products Co., a Cincinnati maker of concessions equipment for entertainment venues. "At best, there will be minor problems."

While he acknowledged that some home PCs might display the wrong dates, Rizzo said that's nothing compared with what Y2K remediation means to businesses. "If they're in business to make money," he said, "they're going to make sure it's going to work."

Little Economic Impact From Y2K

An overwhelming number of IT managers are convinced that Y2K will cause only minor problems nationwide.

Q. What impact will Y2K have on the U.S. economy?

Significant	9/99	7%
	12/99	5%
Spot problems	9/99	62%
	12/99	54%
Minor impact	9/99	29%
	12/99	36%
No impact	9/99	2%
	12/99	5%

SOURCE: *COMPUTERWORLD* RESEARCH SURVEYS OF 300 IT MANAGERS (SEPTEMBER) AND 265 IT MANAGERS (WEEK OF DEC. 6)

Y2K Confidence Remains Steady

IT managers remain highly confident that their systems are year 2000 compliant.

Q. On a scale of 1 (not at all confident) to 5 (extremely confident), how confident are you that your company's information systems will be year 2000 compliant by Jan. 1?

A. Mean answers from companies with at least 500 employees:

Sept. 1998:	4.58
Oct. 1998	4.59
March 1999	4.64
June 1999	4.86
Sept. 1999	4.81
Dec. 1999	4.8

SOURCE: *COMPUTERWORLD* RESEARCH SURVEYS OF ABOUT 100 IT MANAGERS AT COMPANIES WITH AT LEAST 500 EMPLOYEES

KEVIN FOGARTY/BRICKS AND CLICKS

Dot-coms will disappear

OK, here's a prediction for the new year: The dot-com companies that are burning up Wall Street and the commercial airwaves today will be gone in two years. Many, of course, will be incinerated by their own burn rates or will be bought up by brick-and-mortar rivals. The rest, the survivors, will adapt themselves using a technology most have underused until now: bricks.

Everyone knows that Amazon.com — which launched the highest-profile e-commerce operation on earth, based on the idea that you can build a business selling out of someone else's warehouse — is rushing to build a high-tech distribution-center network. When you're selling commodities like books, toys or CDs, the only way to make money is to control delivery costs.

Toysmart.com is going the same way, with a flagship retail store at its Waltham, Mass., headquarters, warehouses under construction and plans to build more retail stores, probably in the amusement parks of Disney, which has reportedly invested about $45 million in the firm.

The trend isn't driven just by the need to deliver product. Garden.com, which hired staff to write how-to gardening stories for its site, is now publishing a magazine. On paper. Delivered by the U.S. Postal Service. Talk about a legacy medium.

And Charles Schwab, whose online customers account for 60% of its trades, has doubled the number of its brick-and-mortar locations to make it easier to get advice in person.

The dot-coms are coming off-line because that's where the money is, and they're going to compete even more directly with the brick-and-mortars to get it.

"The rosiest projections are that only 10% of the toy market will be on-line in seven years," says Toysmart.com CEO David Lord. "It seems difficult to imagine that you can give up 90% of that market if you're in it for the long term."

KEVIN FOGARTY is *Computerworld*'s business editor. Contact him at kevin_fogarty@computerworld.com.

Eventually, brick-and-click companies will have to meet in the middle, using business models that leverage the infrastructure of the real world with the convenience of the Web. Some, like Garden.com, may focus on catalogs and online sales. Others, like Amazon, will build up substantial brick infrastructures.

But the really interesting stories will be the ones written by traditional players who may not have weighed in yet. Look at the Borders online bookstore, which fell so far behind Amazon.com and Barnesandnoble.com that it could barely keep them in sight. Now it's taping book signings by authors like J. K. Rowling to run online for readers who couldn't get to the store. That pulls in the masses of her hectoring fans and lets their parents check out the author and her books at the same time.

Another prediction: The brick-and-mortars will get their online acts together this year and push back all but the leaders among the dot-coms.

"The companies that will be successful are the ones that can effectively mix multiple media — stores, catalogs and the Web," predicts Cathleen Benko at Deloitte Consulting, the e-commerce arm of Deloitte & Touche. She calls the e-commerce competition a game of chess in which only the first few moves have been made.

But later in the game, it will be much harder to tell if the winners were born of bricks or clicks.

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Service Needs Drive Tech Decisions at Lands' End

Report: Ineffective help features cause retailers to lose millions in online sales

BY JULIA KING
DODGEVILLE, WIS.

IT'S JUST AFTER 10 on a Thursday morning six weeks before Christmas, and this is James C.'s second phone call to Lands' End Inc. in less than 12 hours.

He's already ordered a charcoal-gray blazer and slacks for his wife. Now he wants a skirt from a different page. But will it match the outfit? And must he pay a second shipping charge?

Nancy Mortimer, a 15-year customer service veteran, puts James on hold. She dials up a Lands' End "specialty shopper," who lays out the garments side by side in a room that contains every stitch of clothing Lands' End sells.

No match, the specialist concludes. Nancy puts in a second call to her supervisor, who agrees to scrap the shipping charges. Ninety-six seconds later, Mortimer is back on the phone with James, who opts for a different skirt and thanks her four times for her help.

James placed his order over the phone. But had he clicked in his order to *www.landsend.com*, he would have received the same seamless customer service, either by talking to a customer service representative over the phone or via text-based messages on-screen.

"One of the great fallacies of the Internet is [that] you'll save on customer service costs because customers would serve themselves," said Bill Bass, vice president of electronic commerce at the $1.4 billion retailer.

Lands' End has discovered that simply isn't the case, but it isn't worrying about it. Instead, the king of cotton turtlenecks, Polartec parkas and other apparel is leveraging its already well-known customer service online as its chief means of moving customers to the Internet. That would cut right to the heart of its heftiest expense: the annual production and mailing of more than 250 million catalogs, which now accounts for 41% ($201 million) of its annual operating costs.

Examples of the company's online customer service features include one-click sizing tips and quick-time video demonstrations of how to take accurate measurements. Another example is its exclusive Shop With a Friend feature, which lets two friends or family members simultaneously view the same Web pages and have an on-screen chat about what they're viewing.

Earlier this year, Lands' End struck a deal with WebLine Communications Corp. — now part of Cisco Systems Inc. — for exclusive use of the technology behind the Lands' End site's Shop With a Friend and live online help features, which let online customers communicate in real time with a customer service representative via on-screen text or phone.

Lands' End information technology employees worked with WebLine to enhance the technology in exchange for exclusive use of it through the all-important holiday selling season, said Bass.

Not only do all of these features improve customer service by helping shoppers order exactly what they want, they should also help reduce merchandise returns, said David Marshak, an analyst at Patricia Seybold Group in Boston.

In contrast, most other electronic retailers continue to focus on glitzy site designs.

They might want to review their business plans. Businesses lost $1.6 billion in online sales last year specifically because of a lack of customer service support, according to Datamonitor, a market analysis firm in New York. This year, customer service-related losses are expected to double to $3.2 billion because online customers who might otherwise make a purchase have no way to get answers to their questions online.

However, two weeks ago, Lands' End surprised analysts by announcing an 18% drop in preholiday sales. The company blamed the slowdown on fewer catalog mailings and warm November weather, among other things. Analysts also cited merchandising problems, noting that Lands' End needs to update and expand its line of products if it is to capture a significant share of the ever-growing population of younger, hipper buyers.

Still, when it comes to online shopping and customer service, "Lands' End is the leader. They set the bar for others," said Marshak.

From 1997 to 1998, Lands' End's online sales jumped from $18 million to $61 million. By mid-November this year, Lands' End had sold more than $150 million worth of apparel online, more than anyone else in cyberspace, analysts said.

Its innovative online customer service features also are helping Lands' End reach a new set of consumers. Prior to 1999, roughly 20% of the company's online purchases were made by new customers. This year, that figure is expected to more than double, said Bass. ◗

MARC BERLOW

THE TEAM BEHIND LANDS' END's Internet customer service strategy includes (from left) Joan Conlin, director of distribution; Bill Bass, vice president of e-commerce; Denise Moran, Internet customer service representative; and Linda Severson, IT manager

Keeping Reps Happy, Helpful

Customer service workers who support Lands' End's online shoppers typically respond to customer e-mails within three hours.

Not that anyone's counting.

Unlike customer service reps at other electronic retailers, employees at Lands' End aren't evaluated on how many calls or chat messages they can handle in an hour or how quickly they complete calls.

Also unique is the company's strict policy forbidding its service reps from trying to upsell customers. Retailers upsell when they try to pitch a customer a shirt to go with the tie he just ordered.

Lands' End's customer service employees also receive two to three hours of training on all new products and computer system changes each month. Online representatives can enroll in grammar and spelling workshops to brush up on basic skills for text-based chat sessions.

All of these policies are unusual from a customer service standpoint, said Pete McGarahan, a customer support expert and chairman of Help Desk 2000, an Atlanta-based support organization. What's far more typical is for customer service agents' performance to be judged on a whole slew of numbers, including how long it takes them to complete calls or how many e-mails they can respond to in an hour.

But in time, said McGarahan, "we'll see the rest of the industry moving toward what Lands' End is doing."

The reason: It works.

"In terms of the shopping experience, they've done the most of anyone to make it easier to shop," said David Marshak, an analyst at Boston-based Patricia Seybold Group.

– Julia King

MOREONLINE

For *Computerworld* coverage of online retailing and related links, visit our Web site.
www.computerworld.com/more

WORKSTYLES

What It's Like to Work at . . . Starbucks

Interviewee: Kimberlee Sherman, director of production process services
Company: Starbucks Corp. (*www.starbucks.com*)
Main location: Seattle, near the new baseball stadium
Number of information technology employees: 225
Number of employees (end users): 35,000 worldwide, including those in the cafés
Tenure: Almost eight years
What does your job entail? "I'm leading a new, self-managed work team that's implementing standard processes for IT project management, telecommunications, operations and technical services."
Dress code: "We call it 'professional casual.' Nice jeans are appropriate."
Workday: "We're a 24-hour-a-day IT shop, so we have varying schedules and flextime."
What are your most important systems? "Our point-of-sale systems in the stores [and] the manufacturing and distribution systems at our roasting plants, [plus] we're in the process of implementing ERP systems. We're taking a best-of-breed approach."
How does IT contribute to the sale of a bag of coffee beans? "It starts with the green coffee, tracking the beans all the way through the roasting process, where we have silo management systems and production control. Then we have distribution systems to track the roasted beans and systems in the stores to track receipt. Then the point-of-sale system feeds back into corporate, where a replenishment order is generated. It's pretty much full circle."
Do you use the Starbucks store jargon in IT? "Yes. In the IT budget last year, we didn't know what the exact rates would be for contract programmers, so we classified them as short, tall, grande or venti."
Examples of in-house IT training: Unix, life cycle methodology, database query tools and AS/400
What kind of bonuses do you get? "We have a performance-oriented, spot-bonus program in IT. We try to keep salaries current with the market, but it's hard to do that systematically, so spot bonuses help. It makes us more competitive. And all partners get stock options – all employees are considered partners because we all own stock in the company."
Decor: "We have the same look and feel as our stores, with the same color schemes. And we have the same big comfy chairs in the common areas. On the top floor there's a small coffee roaster, and sometimes they conduct coffee tastings up there. We have mini putting greens all throughout IT."
Any windows? Yes; "I have a window in my cube with a view of the Olympic Mountains."
Do people carry beepers and cell phones? "Yes. Anyone responsible for an application carries a pager." On-call support rotates weekly.
In-house cafeteria? The Mezza Cafe (full-service), the Pronto Deli (bagels, soups and sandwiches) and vending machines with sandwiches from Briazz, a local shop
Food-service rating (on a scale of 1 to 10, with 10 the best): "Excellent; 9 or 10."
Free refreshments: "Unlimited coffee and tea beverages. We have espresso kitchens in all corners of the building . . . and the refrigerators are fully stocked with milk and syrups and eggnog. Everyone is trained to make the beverages we sell in our stores."
Other on-site amenities: The Java Gym, a full-service gym with aerobics, kickboxing and yoga classes and a masseuse once per week
The one thing everyone complains about: Parking. "It's hard to get a space in the garage."
Where the office gossips: "Outside cubes, in the common areas, the kitchen, wherever."
Perks: A free pound of coffee beans every week, a 30% discount in Starbucks cafés nationwide and post-project parties
Quote: "I really like the pace here. There's a lot of change, and that's very energizing."

– Leslie Goff

ED YOURDON

Post-Y2K proactive

FOR BETTER OR WORSE, many Y2K managers are now saying, "Remediation is done, testing is finished, contingency plans are approved, command centers are staffed and SWAT teams are ready to pounce on any problems. There's nothing left to do but sit back and wait, right?" For some organizations, this will be a practical approach: There will be more than enough trouble to keep everyone busy when Jan. 1 arrives. Meanwhile, those organizations that haven't finished their Y2K repairs have little alternative but to wait and see what breaks; the politically acceptable description is "fix on failure."

But what about the organizations that *have* done good jobs of repairing their systems and working closely with their suppliers? What about the organizations that find everything is quiet when the clock strikes midnight on New Year's Eve?

The answer is to take a proactive stance and use every calm, quiet moment to test for problems *before* they become crises. Just because nothing goes wrong Jan. 1 *doesn't* necessarily mean you've eliminated every bug from your internal systems. Indeed, it may simply mean that you've been lucky so far. But once you're operating in a "true" post-Y2K environment (as opposed to the time-machine testing done prior to Dec. 31), you can rerun your systems tests and possibly expose some bugs that managed to remain hidden.

Similarly, if you've done all your Y2K testing *without* "aging" or rolling forward the date fields in your databases (because it was too expensive and time-consuming to do so), then once the calendar reaches Jan. 1, the aging will be automatic and "real."

And it's worth re-emphasizing the advice I offered in my Oct. 18 column: Take advantage of every spare moment to run "integrity tests" on your databases to ensure that date fields and computational results are still valid, because that's where a handful of the subtle, insidious Y2K bugs will wreak their damage.

It's also important to take a proactive stance with your suppliers, customers and business partners. Just because an important supplier didn't call you up on New Year's Day to tell you about his problems doesn't necessarily mean he's in good shape. Indeed, it might mean that his phones are down or that he's gone bankrupt.

Use every calm, quiet moment to test for problems before they become crises.

Thus, the first priority is a simple phone call, fax or e-mail message asking, "Are you up and running?" (If you and your suppliers have *really* been working closely together, you will have organized this ahead of time, so that the "yes, I'm still here" message will be generated automatically.) Once you know that your most important suppliers are basically operational, then you can engage in the same kind of proactive testing mentioned above.

Don't wait for Y2K-related interface problems to pop up and surprise you on, say, Jan. 31, if there's some way to test for their existence in the early days of January.

Beyond this, build a proactive network of employees, customers and observers in key geographic areas where your company does business to provide the earliest possible warning of so-called "unknown unknown" problems — problems whose existence wasn't even on your Y2K radar screen and whose status couldn't have been determined anyway.

This is particularly important for multinationals. We'll all be grateful if things work smoothly in our own country, but what if Y2K problems lead to unrest in Brazil, South Africa, Indonesia or the Middle East? In countries where the press is highly regulated, it could be difficult to get an accurate picture of what's going on just by watching CNN. If you've got employees, factories or other assets exposed to danger, a speedy response will be crucial.

Bottom line: If nothing goes wrong on New Year's Eve, we can all breathe a sigh of relief. But only a single sigh. Our work will have just begun, and we should continue testing for at least the first few months of 2000. ◗

Yourdon heads the year 2000 service at Cutter Consortium in Arlington, Mass. Contact him at www.yourdon.com.

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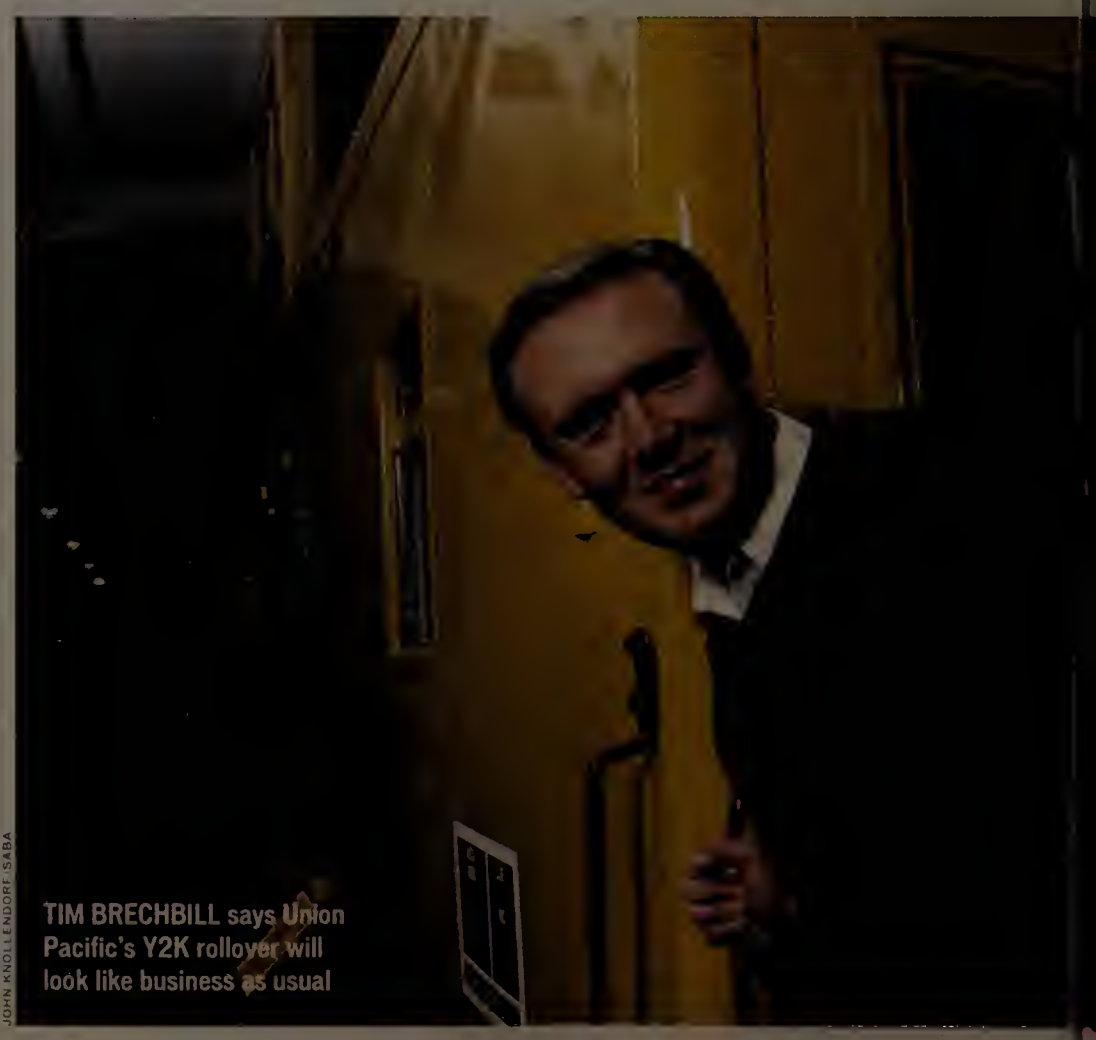
YEAR 2000 CHRONICLES

CHAPTER 7

They've spent years of effort and millions of dollars. They know their systems are set, but they have plans in place in case of a bank run, an executive heart attack or a riot. With the new century in sight, the six companies *Computerworld* has followed in this occasional series are treating the final countdown to Y2K like any routine day



JOHN KNOLL ENDORF/SABA

TIM BRECHBILL says Union Pacific's Y2K rollover will look like business as usual

NABISCO INC.

When 'Done' Means 'Not Yet'

BY GARY H. ANTHES

"WE'RE DONE," said Tony Del Duca, vice president of enterprise supply-chain systems at Nabisco Inc. Still, he acknowledged that the definition of *done* has shifted as the company has moved through its year 2000 project.

"I thought that contingency plans would be the end, but then there were rollover plans after that, and then you're setting up a command post," he said. "It always appears there is one more task you are still doing."

Or undoing. The $8 billion snack-food giant, which had a $42 million Y2K budget, had planned to use cell phones if ordinary communications were knocked out. But the remnants of Hurricane Floyd moved through New Jersey in September and flooded a major cell phone center, knocking out service to Nabisco's headquarters in Parsippany. New plan: satellite phones.

Despite last-minute headaches, there has been a silver lining in the grueling three-year Y2K project for Del Duca and his two principle Y2K deputies — all recently received promotions.

Tim Bilali was bumped up from senior manager to director. He headed year 2000 work for manufacturing systems under Del Duca but now has responsibility for Y2K projects for all Nabisco systems worldwide. "I viewed the [earlier] job as a good opportunity to gain visibility, and I view this job as a reward," he said.

Bilali said the hardest part has been unifying and integrating the activities of information technology, business units and external parties. "There was minimal involvement on the business side until recently," he said. "The prevailing thought was, 'It's an IT problem, and they will resolve it.' "

The solution proved simple. "We said to the businesspeople, 'If this IT system isn't there, how are you going to run the business?' That forced them to think about it, and they are on board now," Bilali said.

Asked what would happen if the satellite phones failed, Bilali said, "We can pack up and go home. You can only plan so much."

Using Y2K Experience

Barbara Calhoun was promoted from Y2K project manager for manufacturing systems to manager of a new Program Management Office, which encompasses all of IT at Nabisco. Her job: to bring the methodologies, standards and project management techniques she developed for year 2000 in manufacturing to IT areas across the company.

"I want the [office] to be a home base for project managers at Nabisco, where they can share information about how they do things," she said.

NABISCO'S Tim Bilali and Barbara Calhoun won promotions for Y2K work

GIORGIO PALMISANO

Another goal is to use the office as a way to get business managers to appreciate the work IT does and ensure that it's meeting their needs, Calhoun added.

Asked about Y2K fatigue, Calhoun said it doesn't exist at Nabisco. "The more it's in the news, the more it's like, 'Wow, we are really working on something important.' "

But after a moment's thought, Calhoun acknowledged there might be just a little fatigue with the punishing documentation workload imposed by IT and Nabisco's legal staff requirements. Nabisco auditors "are actually reading it," she said.

> The more it's in the news, the more it's like, 'Wow, we are really working on something important.'
>
> BARBARA CALHOUN, MANAGER, PROGRAM MANAGEMENT OFFICE, NABISCO

UNION PACIFIC CORP.

Making Jan. 1 A Routine Day

BY JULIA KING

DON'T LOOK for special customer call-in numbers, Y2K duty officers or other visible signs of once-in-a-millennium special measures at Omaha-based railroad giant Union Pacific Corp. (UP) this New Year's Eve.

But make no mistake: That doesn't mean they aren't being taken.

"We don't want to give people special phone numbers," said Tim Brechbill, the $9 billion rail company's year 2000 project manager. To avoid creating even a whiff of panic, "we're not asking anybody to do something special," he said.

But behind the scenes, UP has gone to great lengths to ensure it's business as usual in the crucial hours before and after midnight Dec. 31.

UP will be staffing a Y2K command center at each of its three data centers plus a central operations command center at its Harriman Dispatch Center in Omaha. From 11 p.m. CST on Dec. 31 until the wee morning hours of Jan. 1, designated employees from the railroad's various units across 23 states will call in to fill in the blanks on prescripted status reports — all part of the railroad's behind-the-scenes Y2K rollover operations. The railroad has a $46 million Y2K budget.

"The scripts go through all of the [railroad's] processes," said Jerry Lucas, who heads the executive oversight committee for Y2K issues. For example, transportation control will report on the status of specific activities, such as calling in train crews and locomotive functions, he said.

"There's a very detailed game plan from 11 p.m. through the first three hours after midnight. We have the scripts down to the minute of who reports in when and with what exact information," Lucas said. For an as-yet-undetermined amount of time just after midnight, all traffic and operations will also be halted.

"For some period of time, the trains will not be running. This is a decision we're still trying to finalize," Lucas said. "But we are going to do certain testing after midnight before anything moves."

The good news is that throughout the rollover reporting and testing period, Brechbill is anticipating low volumes of traffic. Historically, UP does only about 30% of its normal daily business on New Year's Eve. Although the railroad anticipated otherwise, this year should be no different, according to information UP sought from its largest customers.

"What we found pretty much across the board is that people are doing business as usual," Brechbill said.

"We didn't see any auto manufacturers or other big customers stockpiling [supplies], which we had anticipated could be one of our biggest problems — bigger than Y2K," he said.

Brechbill already has his next assignment. He'll be leading another project that cuts across multiple departments, designing and implementing a customer relationship management (CRM) system scheduled for funding next year.

"I don't think of [the new role] as a reward," he said. "But I think one of the reasons I was chosen is that on Y2K, I had to work with a lot of different people in a lot of different departments." On the CRM project, he said, "a lot of the people will be the same ones I dealt with on Y2K."

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YEAR 2000 CHRONICLES

CHAPTER 7

Continued from page 43

CANADIAN IMPERIAL BANK OF COMMERCE

Vaulting Past The Date Change

BY THOMAS HOFFMAN

The year 2000 date change isn't a single event for Canadian Imperial Bank of Commerce (CIBC) to manage. The big event will likely be preceded by a run-up of heavier-than-normal withdrawal activity the last week of December by customers who want to make sure they have enough cash on hand in the event of any service disruptions.

And it won't necessarily end even after the bank completes its first batch-processing run Jan. 5. (The bank is closed Jan. 1 to 3. Its first full day of business next year is Jan. 4.)

JOHN BURNS, vice president of projects at CIBC

That's because the Toronto-based bank will be on the lookout for any anomalies with special-interest calculations done at the end of different financial periods throughout the year. Plus, 2000 is a leap year and, historically, organizations have run into processing problems on Feb. 29 "because the code is only executed once every four years," said John Burns, vice president of projects at CIBC.

But Burns said he's confident that operations will continue to go smoothly for the $170.2 billion (in assets) bank.

CIBC, which allotted $162 million to fixing year 2000 bugs, has been continuously testing its operations for any trouble spots. Outside of a few "obscure" discoveries — such as a few internal print reports labeled with the wrong dates — "it's almost a boring time" in the waning hours of the 20th century, said Burns.

In fact, since March, CIBC has whittled its core Y2K team down from 35 people to 20. And the bank wouldn't even be carrying that many people into the transition weekend if it weren't for its need to update Canadian and international regulators, such as the U.S. Federal Reserve System, about its status.

Toward that end, CIBC will dissolve its Y2K program office after Jan. 1, said Burns. If any Y2K-related issues arise after that date, managers who head particular business units or geographic regions will deal with them, he said.

That's not to say the bank will stop updating its customers and investors about its Y2K status over the weekend. In addition to having some of the Y2K team members update the company's Web site (*www.cibc.com*), call center agents will be prepared to answer customers' questions about the bank's rollover status.

Once the Y2K program office has been dissolved, said Burns, the other team members "will move back into other project work." They won't be idle very long — the bank is restructuring under chairman and CEO John Hunkin, who took over the top post June 3. "So that will lead to other projects," said Burns.

For now, Y2K team members are catching a breather. Like other companies, CIBC has stopped employees from taking vacations over the holiday period, and senior executives are being asked to stay within an hour's drive of their offices.

If little — or nothing — happens over New Year's weekend, employees will probably wonder why so many people were asked to be on standby, said Burns. "But in the end, hopefully, they'll realize that it's a customer service issue." ◗

CONECTIV

Ready for Worst, Expecting Little

BY JULIA KING

RAY CIVATTE is an engineer by training who has been in the electric utility business for 30 years. He has designed power plants, run them plus managed the IT group at one of the two mid-Atlantic electric utilities that merged two years ago to become Conectiv.

"That's a unique set of experience that makes him absolutely the right choice for Y2K duty officer," said Moira Donoghue, corporate secretary at the $2 billion electric company, which has spent some $15 million preparing for the 2000 date rollover.

CHRIS ARENA, Conectiv's year 2000 manager

As Y2K duty officer, Civatte is in charge of directing the action set forth in the company's detailed Y2K rollover and contingency plans, which cover equipment, services and more than 1 million customers in Conectiv's five-state coverage area. He expects to be planted in Conectiv's Y2K war room in Newark, Del., from the morning of Dec. 31 until Jan. 4, maybe even Jan. 5.

What he doesn't expect — thanks to years of strategizing and practice run-throughs — are big surprises. After two industrywide Y2K drills, plus a companywide drill on Oct. 28, "we've done a thorough job in identifying any issues, and from a systems standpoint, we haven't had any eleventh-hour surprises," Civatte said.

But the Oct. 28 drill, which put employees through prescribed paces for 50 kinds of possible emergencies — including a revolt by citizens who storm a Conectiv office building — did turn up a few minor glitches that have been remedied. One example: Some employees didn't know exactly how to use their backup mobile telephones and the company's 800-MHz radio system for voice communications. They have received additional training.

Customers' once-keen interest in Y2K also has dramatically subsided. The company's customer service center, which added employees to field calls during last month's televised *Y2K: The Movie*, received a half-dozen calls.

"Panic has subsided considerably over the past six months," said Mary Rucci, Conectiv's public relations manager, whose team has addressed groups about Y2K issues. "When we first went out, we were addressing functions with 200 and 300 people in attendance. Among the discussion topics were survivalist tactics because, then, there was so much fear and panic. Now, we might get six people."

Chris Arena, Conectiv's year 2000 project manager for the past three years, has also assumed a new role — manager of IT infrastructure development — although he will remain closely involved with what began as a computer systems project "that people weren't exactly stepping up to the plate to do" back in 1997. The new job is a natural follow-up to his cross-functional work on Y2K and all the practice he has had working as something of an evangelist for IT in general.

"At the beginning [of the Y2K project], I had to try and convince folks that infrastructure is everyone's concern, that it's not just an IT thing," Arena said.

"A lot of people still take infrastructure for granted," Arena said. "They take for granted that they turn their computer on and it'll all be there. But technology can become like a drug addiction, and if you're not real careful, you can become technology-broke. I'll need to do a better job of communicating about expectations and what technology can and can't perform."

Arena will also retain his Y2K project manager responsibilities, at least through the beginning of March, once Conectiv has made it across a second all-important dateline — Feb. 29.

"We won't be staffed at the same level of urgency that we have been staffed over the past three or four years, but we will keep a crew available," he said.

"The end of the year may be getting all the publicity, but you have to remember that two months later, we'll have a leap year, and we'll need to be on the same watch." ◗

MOREONLINE

For the past two years, *Computerworld* periodically checked in with six companies – including Merrill Lynch and Nabisco – as they tackled and solved their Y2K problems. Check out the Year 2000 Chronicles at **www.computerworld.com/y2kwatch**

- **Chapter 7 (today)**
  Not rested, but tested and ready.
- **Chapter 6 (July 19, 1999)**
  Contingency plans for a disaster – just in case.
- **Chapter 5 (Feb. 8, 1999)**
  Y2K boosts project managers' careers.
- **Chapter 4 (Oct. 12, 1998)**
  Budget plans for the stretch run.
- **Chapter 3 (June 22, 1998)**
  Hunting for unexpected problems.
- **Chapter 2 (March 9, 1998)**
  Suppliers and partners need urgent attention.
- **Chapter 1 (Jan. 12, 1998)**
  The battle for business support, IT staff.

EDWARD GOLDBERG, executive vice president of operations services, plans to stay overnight Dec. 31 at Merrill Lynch's command center

EDWARD SANTALONE

MERRILL LYNCH & CO.

Watching Y2K Unfold, One Market at a Time

BY THOMAS HOFFMAN
NEW YORK

FORGET ABOUT the ball dropping in Times Square on New Year's Eve. For Edward Goldberg and other members of Merrill Lynch & Co.'s year 2000 team, the real action begins on Dec. 31 at 6 a.m. EST.

That's when the first of Merrill Lynch's offices around the world — in this case, Auckland, New Zealand — will greet the new year. Goldberg and his crew will be anxiously monitoring the results from the company's primary command center on New York's lower West Side.

How Auckland deals with the date change won't necessarily make or break the world's biggest brokerage. But it could be a harbinger of things to come.

"I would take this as a terrible defeat if we didn't succeed [with our Y2K preparations]," said Goldberg, executive vice president of the company's operations services group. Like most of the 40-person Y2K team that will be on the first 12-hour shift in Merrill Lynch's New York command center, Goldberg, a 38-year company veteran, will have a cot set up so he can catch a few winks between milestones.

"My wife asked me if we were going to the club" to ring in the new year, chuckled Goldberg. Instead, he'll break from the company's command center for a few hours on New Year's Eve to join his wife and some friends for dinner in the city before returning to the command center before midnight.

Other Big Dates

Though midnight in New York will be a critical time for Merrill Lynch, Jan. 3 and 4 are equally important, said Jim Murtha, senior director of mandated initiatives at the firm. That's because Merrill Lynch and other big brokerages will be executing their first market transactions and nightly batch-processing runs on those dates.

Murtha and other senior managers — including Merrill Lynch Chairman David Komansky — will be carrying binders that contain key event time lines. For example, Komansky will know that the first stock exchange to open in the new year won't be in Tokyo, New York or London, but in Cairo (Jan. 2 at 2 a.m. EST).

"David and I are joined at the hip," said Goldberg. "We'll let him sleep some and touch base with him with [periodic] health checks. I'll call him [after midnight] to wish him a happy New Year and tell him where we're at."

Dress Rehearsal

In early November, Merrill Lynch, which has a $525 million year 2000 project budget, held a Y2K dress rehearsal that included 96 different scenarios. For example, at one point during the drill, Murtha pretended to experience chest pains. That led him and Goldberg to discover that a handful of the firm's 80 command center employees in New York have CPR training.

Merrill Lynch began paring down its core Y2K team from 130 people in July after it had completed its remediation efforts. Some staffers have been filtered back into different parts of the organization such as capital markets and equity trading, while others have been assigned to work on other major upcoming projects such as Wall Street's plan to price stocks in decimals rather than fractions, which is slated to begin in mid-2000, Murtha said.

Like other companies, Merrill Lynch can't completely shield its Y2K team from experiencing millennium burnout. However, said Goldberg, knowing that the company's upper echelon holds weekly Y2K meetings "keeps people on their toes."

The brokerage also can't guarantee that it can thwart any acts of cyberterrorism that might occur through early January, but such an event is unlikely, said Murtha. "This will be the hardest time to get a virus in play," with so many technical experts on hand monitoring systems, said Murtha.

Security

Plus, information technology professionals, including consultants, have to go through intensive security checks to work for Wall Street firms like Merrill Lynch. And given the amount of testing and retesting Merrill Lynch has conducted on its software code, the chances of cybersabotage are pretty slim, said Goldberg.

"This is not the kind of shop where someone can walk in and change [software] code," he added.

So what should investors and other citizens do to prepare for the date change? "Have a good night's sleep, put on the TV in the morning and see what's going on," Goldberg said. "You don't have to buy a gun or set up a tent in the woods."

C. R. BARD INC

Thinking of the Next Projects

BY MARYFRAN JOHNSON

THE TURN of the century next week is expected to be a big yawn at C. R. Bard Inc., a low-key culmination of two intense years in the lives of Y2K project leader Paul Maszczak and his small crew of contractors. "We anticipate it being a nonevent," he said.

The $1.3 billion Murray Hill, N.J.-based medical device manufacturer spent $11 million on date-conversion work, system updating, product checking and extensive communication with customers, suppliers and trading partners worldwide. The final code changes were locked in five months ago, the Y2K tests and network checks passed and the contingency plans trotted smoothly through their paces.

Now it's all over but the countdown.

"I won't be partying on New Year's Eve, but I'm not going to be sweating it," said Cherise Vaughn, who ran the communications and customer service end of Bard's project from her small consulting company, C-Coe PeopleTech, in Charleston, S.C. "My people know more about Bard than some of their own employees."

"This is the most impressive team effort I've ever been involved in," Maszczak said of his outsourced operation, which involved fewer than a dozen IT specialists and programmers over the past two years.

As he was dealing with the Y2K project, several of his IT managers stepped into leadership roles in Bard's technical infrastructure group — about 70 nationwide. They learned "a tremendous amount about our business," Maszczak said. "Every one of those people is 10 times the manager and IT person they were at the beginning of all this."

In the course of the project, Vaughn dealt with people at Bard installations in Germany, Australia, Canada and France. She answered thousands of queries about the Y2K status of products, tracked information and lost all fear of the legal profession.

"Used to be people would mention they were going to call their lawyer, and I'd freak out. That doesn't faze me a bit now," she said, laughing.

Her next challenge will be expanding her computer training firm into — what else? — Web site development work.

The personal aftermath of working on Y2K is something of an open question for Maszczak. "I think Y2K gets under your skin. Going back to normal day-to-day isn't going to cut it," he said. "What I really like to do is deal with problems, and Y2K project work gives you those kinds of skills."

A YEAR-END CHECKLIST

Got cell phones? Pencils? Know the whereabouts of your staff? Use our Y2K checklist to help you make sure you have the information and resources you need. Don't sweat the details. Write them down and check them off

BY KATHLEEN MELYMUKA

IN THE FINAL DAYS and hours before the year 2000 date change, you want to be sure your team stays on track. A checklist can keep you focused despite distractions that may arise. The details of each list may vary, but most will focus on three essentials: communications, logistics and timing. Here are a few key items Y2K professionals around the country will be checking off as this year winds down.

Communications and People

❑ **COMMUNICATIONS BULLET-PROOFED.** "Loss of communications would be a bigger issue than loss of electricity, so we're really banging on those plans," says Steve Jost, Y2K manager at Deere & Co., the Moline, Ill.-based manufacturer of heavy machinery. That means having phones, cell phones, pagers and even radios ready.

❑ **CALL LISTS UPDATED.** "All companies have turnover, and in the IT arena it's significant," says Chas Snyder, Y2K project manager at Levi Strauss & Co. in San Francisco. Are you sure the people on your Y2K call lists are still at the company? "The lists change a lot, and we have to make sure that list is accurate and has everybody we need," he says.

❑ **PHONE TRAFFIC STRATEGY.** To minimize phone traffic jams, designate certain phone lines for incoming calls only and others for outgoing calls only, says Paul Kirvan, a senior consultant at Telcordia Technologies Inc., a telecommunications company in Morristown, N.J.

❑ **CALL-IN CAPABILITY.** Double-check your hot lines, call centers and other important phone numbers to be sure they work, says Irene Dec, vice president for information services and Y2K manager at Prudential Insurance Company of America in Newark, N.J. And see that the numbers have been disseminated to those who will need them.

❑ **CALL-IN INFORMATION.** Make sure your call handlers have up-to-date information to answer customer questions, Dec says. And make sure any prerecorded statements are current and correct.

❑ **MEDIA INQUIRIES.** "We know that news organizations are going to be calling us to see what happened," says Deborah Stagg, Y2K project manager at San Diego Data Processing Corp., which handles information technology for the city of San Diego. Each manager on Stagg's team will keep track of any problems, determine whether they're Y2K-related and pass the information along to a designated media contact person.

❑ **VENDOR COMMUNICATIONS.** "Vendors keep surprising us with Y2K patches," says Snyder. "You have to be on guard for last-minute fixes." Keep in touch with your vendor representative, and check the vendor's Web site as well.

Logistics

❑ **COMMAND CENTER.** Does your command center have everything it needs: tables and chairs, a television and/or radio, phone lines and phones, a dedicated conference phone, cell phones from various carriers (in case some go down), pagers, fax machines, networked PCs, printers, message boards with pushpins or markers, flashlights, batteries, a phone log book, lists of contact numbers, Y2K contingency plan documentation, pads, pens, pencils, food, drinks and cots?

❑ **CONTINGENCIES FOR CONTINGENCIES.** "When you make contingency plans, it's very tempting and easy to concentrate on the big events," Jost says. "You may have grandiose plans in place, but how are you going to read contingency plans in the dark?" Did you check to make sure the flashlights really *are* stored in that supply closet? How about batteries? And how will you find the keys to that closet if the office is dark? Is there a supply of toner for the copy machine? Is there a supply of carbon paper in case the copy machine goes down?

❑ **MANUAL PROCESSES.** Sure, the contingency plans are in place, says Stagg, but how about the manual forms and the pencils, pens and *erasers* to fill them out? Make sure each department is set up and ready to roll.

❑ **WORKER WHEREABOUTS.** You've got phone numbers, says Dec, but do you actually know which buildings people will be working in, when they'll be where and what their roles are?

❑ **ON-CALL LOCATIONS.** "If your program is running at 1 a.m., we need to know where you're going to be," Stagg says. That means a phone number, a backup phone number *and* an address. "Otherwise, if you're at a party somewhere, we may never find you."

Timing

❑ **ROLLOVER SCRIPT.** There should be a minute-by-minute plan for each Y2K activity, from backups and system shutdowns to restarts and process checks. That will help you stay focused if things begin to go awry. "The whole weekend, from Thursday through Monday, is very detailed," says Snyder. "And we'll be adding detail till the bitter end."

❑ **WORKLOAD ADJUSTMENTS.** If you plan to run batch jobs earlier than usual, remember that you'll have to move back the rest of the schedule to open up a time slot, says Dec. And if Y2K test runs eat into the normal batch schedule moving forward, you'll have to adjust that also. ◗

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NEGLECTED WORKFOR

Despite a 4% U.S. unemployment rate, most American Indians can't get work. Meanwhile, IT managers hire increasing numbers of foreign workers under H-1B visas. New initiatives hope to change that picture by bringing technology and training to the reservations By Bronwyn Fryer

RAE PEPPERS has her hands full. As director of the Tribal Business Information Technology Center at Dull Knife Memorial Tribal College on the Cheyenne reservation near Billings, Mont., she's singlehandedly building a 100-client Windows NT network. She's also installing a T1 line and setting up a 7,000-record tribal enrollment database. Unemployed she isn't.

By contrast, too many of the estimated 2.4 million American Indians have no work at all — a shameful situation, given that the overall U.S. unemployment rate remains at a historic low of 4%.

In technology-related fields, managers are so desperate for workers that Congress this year passed a special bill doubling the number of H-1B visas for foreign workers with IT skills. But despite the robust economy, many American Indian tribes suffer unemployment rates of a staggering 50%, some even higher.

This scenario has spurred American Indian leaders, academics and philanthropic organizations to focus on two-year tribal colleges like Dull Knife, which they say can make a huge difference in reservation economies. Under a recent grant from the National Science Foundation, tribal colleges are being outfitted with advanced information systems that will allow students to take distance-learning classes.

Meanwhile, the colleges' computer science courses are encouraging young people to become interested in technology. "We're trying to jump a generation of technology to train a generation of young American Indian people in the field," says Tom Davis, president of Lac Courte Oreilles Ojibwa Community College in Hayward, Wis., and spokesman for the American Indian Higher Education Consortium (AIHEC).

Peoples of the (Remote) Land

Tribal members and others who work closely with American Indians cite a number of reasons why this group hasn't yet benefited from the explosion of the information economy. Primary among these is geography: Many reservations are far from major urban areas.

"My mother is from Juneau," says Alaskan Tlingit tribe member Mark Trebian, who today works as an asynchronous network designer at Lac Courte Oreilles. "There's no real infrastructure up there. Communication is all phone-based, and it's spotty at that."

James Laducer, a Chippewa tribe member who runs one of the very few privately owned American Indian companies in the U.S., blames the 200-year-old tribal system of government that "fosters dependency and limits free enterprise."

An estimated 38% of the highly skilled employees at Laducer's company, Laducer and Associates, an IT services firm near Bismarck, N.D., are themselves American Indian. Laducer says all his employees have a high work ethic, but the reservation system from which they come discourages enterprise.

The protective, insular culture of reservation life has also discouraged tribe members from investigating technology. "A lot of our people don't want to leave home, and they're frightened of technology," Peppers says.

Indeed, technology is anathema to a people whose traditions and culture depend on physical contact with the earth and other people, observes Victor Chavez, who leads Sandia National Laboratories' small-business empowerment programs from his office in Albuquerque, N.M. Chavez is working with local Navajo and Laguna Pueblo tribes to bring technology onto reservations.

"When the key to the culture is its roots in Mother Earth, the virtual world — using e-mail to talk to someone in Japan, or selling a handwoven blanket on the Internet — is a difficult concept to grasp," Chavez says.

Despite these daunting is-

CE

sues, young people with access to computers and an interest in technology can enjoy stunning success. Example: 25-year-old Darrell Begay, who grew up on a Navajo reservation in New Mexico and spent his youth herding cattle. Begay had never touched a computer until he went to a tribal college. "That's when I took my first computer class, and I've never looked back," he says.

Begay was able to come up with the $2,700 he needed to enroll in the Summer Institute in Computer Science (SICS) at the University of California at Irvine. Today, he's among the 50% of program participants to pursue a degree in computer science. A senior, he's now a C++ wizard, and he's working at a start-up called NexTake Corp. in Newport Beach, Calif.

ALAN LEVENSON

DARRELL BEGAY took one computer class and "never looked back." Now a senior in college, he's a C++ wizard working at a California start-up called NexTake

Role Model

"My family is ecstatic that I'm a productive member of society, and that I'm a model for my nephews and nieces," he says. "I only wish I'd learned about computers at their age."

American Indians who haven't grown up on reservations feel they have less difficulty getting an education and acclimating to the broader business culture of the U.S., says Dan Wall, a Potawatomi tribe member who works as a software process-improvement manager at Stamford, Conn.-based Xerox Corp. Wall grew up in New York state and has visited the tribe's reservation in Oklahoma only once. This distancing has played a part in his attitude, he says: "I've always felt that the opportunity is there for anyone with the education and the skills."

Mark Hunter, a 26-year-old Choctaw tribe member who grew up in San Antonio and is now working as an electronic business specialist at IBM in Dallas, says he's had a similar experience. A keen interest in engineering and good grades in school helped Hunter graduate from Dartmouth College, where he was part of a small group of American Indian students.

Today, Hunter is helping IBM "expand the pond for qualified Native Americans with the right skills," he says. IBM sponsors high school students with internships, scholarships and tutoring and support programs like SICS.

Today, educational and philanthropic organizations are looking harder at reservations and are just starting to make inroads. In addition to SICS and AIHEC, others are working on bringing technology and training to a population that has been largely overlooked.

The key to economic recovery and self-sufficiency, they say, is the Internet. By bringing the Internet to tribal colleges and, if possible, to homes on reservations, American Indians who want to stay on reservations will gain an economic and educational tool they haven't had before. ◗

Fryer is a freelance writer in Santa Cruz, Calif.

Did You Know . . . ?

■ There are approximately 2.4 million American Indians in the U.S. – almost 1% of the population (U.S. Census Bureau, June 1999).

■ There are 556 federally recognized tribes (U.S. Bureau of Indian Affairs, December 1998).

■ There are 314 American Indian reservations. The smallest is the Likely Rancheria in California, with less than two acres. The largest is Navajo, with about 16 million acres in Arizona, Utah and New Mexico. There are also tribes without land, such as the Ponca in Nebraska and the Lytton Rancheria in California.

■ Twenty-two percent of the American Indian population lives on reservations and trust lands.

■ The smallest tribe, the Augustine Band of Mission Indians in California, has a population of one. The largest tribe, the Cherokee, has a population of approximately 308,000.

■ Thirty-four percent of American Indians over the age of 25 didn't graduate from high school.

■ Nine percent of American Indians have a bachelor's degree or higher; 3% have graduate or professional degrees.

■ One-third of American Indian households live below the poverty level (Census Bureau, 1995).

■ Only 39% of rural households in American Indian communities have telephones, compared with 94% for non-Indian rural communities (U.S. Environmental Protection Agency assessment of technology infrastructure in American Indian communities, June 1999).

■ Of rural American Indian households, 22% have cable television and 9% have PCs. Of those with PCs, only 8% have Internet access (EPA, 1999).

■ In rural areas, 12% of American Indian households lack electricity and 23% lack gas (EPA, 1999).

– Bronwyn Fryer

SOURCE: U.S. CENSUS BUREAU DATA BASED ON THE 1990 U.S. CENSUS. THE DATA FOR AMERICAN INDIANS (AMERICAN INDIAN, ESKIMO AND ALEUT) IS BASED ON SELF-IDENTIFICATION OF RACE. THEREFORE, THE DATA DOESN'T REPRESENT ENROLLED TRIBAL MEMBERS.

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As Director of the AMS Center for Advanced Technologies, Dr. Butler's mission is to increase our understanding of emerging technologies. "Ours is a commitment to keeping AMS clients on the frontier of IT practice," she says. "To address technologies that will fundamentally change the business landscape."

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And where does Dr. Butler gain her understanding of emerging technologies? From her peers, at conferences, from the Web and from *Computerworld*. The Newspaper for IT Leaders.

COMPUTERWORLD
THE NEWSPAPER FOR IT LEADERS

Total Cost of Ownership

BY JACQUELINE EMIGH

TOTAL COST of ownership (TCO) has been a steady beacon in the information technology landscape since 1987, when Bill Kirwin, vice president and research director at Stamford, Conn.-based Gartner Group Inc., first applied the model to desktop systems. Gartner has since extended the model into LANs, client/server software, distributed computing, telecommunications, mainframe data centers and most recently, Windows CE and Palm OS handheld computers. Around the corner are models for storage technology and applications development.

TCO essentially helps a company determine whether it wins or loses from specific technology implementations. "Supporting office workers on Windows can be quite a different thing from supporting stockbrokers on Unix. There can be good and bad implementations in either case. We use TCO to look at the overall impact of the implementation. Cost is the numerator. The denominator might be service, customer satisfaction, quality levels or productivity, for example," Kirwin says.

DEFINITION

Total cost of ownership (TCO) is a model developed by Gartner Group to analyze the direct and indirect costs of owning and using hardware and software. Managers of enterprise systems use various versions of TCO to lower costs while increasing the benefits of information technology deployments.

The 'Futz Factor'

Although cost-of-ownership factors vary according to technology and environment, costs are typically broken out into categories such as capital costs, technical support, administration and end-user operations.

Gartner has also introduced the "futz factor," which refers to the use of IT equipment for nonbusiness activities such as playing games. Although industry experts concur that the futz factor brings a negative impact to the TCO bottom line, they disagree over whether "futz" can be adequately measured.

Still, 78% of all IT administrators acknowledge that they can't document whether or not desktop costs are rising because they "don't track TCO," according to a study by Forrester Research Inc. in Cambridge, Mass. Forrester's report is sharply critical of TCO, dismissing it as "hype."

But others think TCO can shine a light on hidden costs. In fact, concerns over what TCO might show constitute the very reason why some IT managers avoid practicing the methodology, suggests James Delmonte, president of JDA Professional Services Inc. in Houston, an IT staffing firm that also performs cost-benefit consulting.

"For a lot of companies today, the only way to stay competitive is to keep taking advantage of the same technology that their competitors are using, as new products continue to hit the market. And some organizations may not even want to know how much that's costing them," says Delmonte.

Another chief barrier to TCO is the perceived expense of performing a cost-benefit analysis, experts say.

But others suggest that TCO need not be lengthy or expensive. John Rathje, director of advanced technologies in the Office of Information Technologies at Central Michigan University, recently devised a "sample" TCO what-if scenario for what he calls "consistent sign-on." Like the better known "single sign-on" technology, consistent sign-on lets users access all their applications through a single password. But unlike single sign-on, consistent sign-on sometimes calls for multiple log-ons.

Rathje sees his approach as a lot less costly to implement because unlike single sign-on, consistent sign-on doesn't require changes to the underlying software infrastructure. Instead of consolidating directories for multiple applications, all that's needed in consistent sign-on is a change in password assignments. Rathje estimates that the university help desk could save about $750,000 annually through consistent sign-on.

Between Departments

Other obstacles to TCO are interdepartmental in nature. John Malloy, a systems programmer at Partners HealthCare System Inc. in Boston, says that in not-for-profit settings like universities, researchers often obtain computer equipment through grants. IT staffers are sometimes unwilling to count this equipment as assets if the non-IT department isn't managing it, according to Malloy, and therefore can't give a true TCO calculation for the organization.

For-profit companies can also experience interdepartmental stress. "Without TCO, a lot of assets get hidden by being expensed through the departments," Delmonte says. To circumvent this problem, Delmonte advises consolidating the acquisition of assets within a centralized purchasing department.

Indirect Costs

TCO also shines a light on indirect IT costs such as support, training and retooling, experts say.

Companies can use asset management tools to find exactly what hardware and software is out there in the installed base. According to Delmonte, organizations can then save money in the long run by moving users from their existing hardware and software to standard configurations.

It's less expensive for companies to provide companywide training sessions on a single operating environment than to let each department provide its own training. In addition, support and maintenance are simplified if the help desk doesn't need to keep on top of so many products, Delmonte says.

To get companywide acceptance and compliance, TCO typically requires the backing of top-level executives such as the chief financial officer, chief operating officer or CEO, experts say. Otherwise, some departments might drag their feet in participating.

"TCO can be very revealing. It might show that certain departments are too autonomous or that the IT department is being poorly managed," Kirwin says. But TCO appeals to many top-level executives as a way of reining in IT costs, Delmonte says.

Emigh is a freelance writer in Boston.

A Total Cost of Ownership Example

International Data Corp. (IDC) in Framingham, Mass., used TCO to determine costs and benefits experienced by medium-size to large commercial sites that had migrated Lotus Domino servers from PC LANs to IBM's AS/400 midrange systems.

In many cases, the sites included in the study were consolidated on AS/400s because of a need to cost-effectively manage increasing numbers of Domino users, according to IDC. The study compared 15 PC LAN sites to 15 other sites that had migrated from PC LANs to AS/400s.

Domino servers can function as both Web servers and Lotus Notes servers. IDC discovered that the five-year TCO for AS/400s running Domino was 32% less than that of the PC LANs.

But beyond the costs, IDC also found less downtime at the AS/400 sites and markedly higher customer satisfaction among both IT staff and end users. Many pointed to less downtime as the key to increased satisfaction.

They also indicated that Domino was playing a much stronger role in intranet and extranet applications on the AS/400s. On most of the PC LANs, Domino had been used mainly for e-mail.

(The full text of the IDC study is available on the Web at *www.as400.ibm.com/domino/idc.htm*.)

	AS/400 ($/YEAR/USER)	PC LAN ($/YEAR/USER)	AS/400 DIFFERENCE (%)	AS/400 (% OF TOTAL)	PC LAN (% OF TOTAL)
Hardware	13	2	-85	12	1
Software	22	23	5	21	17
Operations staff	70	114	39	67	82
Total	105	139	25	100	100

JOE AUER/DRIVING THE DEAL

No substitute for contract clarity

SO WHAT IS good enough? Clarity, and nothing less. I really hit some supplier hot buttons with the Sept. 27 column "Are 'Best Efforts' Good Enough?" (You can check out that column at: *www.dobetterdeals.com/computerworld.*) One of the printable responses came from Keith Winn, a vice president at a supplier. He notes:

"As a VP of technology and director of product development, I was trained through the years by legal counsel to regard best efforts as a legal term that required that all feasible efforts, up to and including losing money, be applied to the tasks addressed in a best-efforts clause. We were advised to substitute 'commercially reasonable efforts' for 'best efforts.'

"From this school of thought, a best-efforts clause is a very strong obligation on the vendor — one that in software development would require the vendor to hire additional people to finish a job on time, even if it meant the vendor lost money in doing so. Have you heard of this reasoning? Is it outdated? I am certainly not an attorney and would be interested in your experience with this."

Keith, I've been testifying as an expert witness on contracts and negotiations for more than 20 years in state and federal courts. One thing I've learned is that in an IT deal, neither customer nor supplier should leave the issue of compliance for lawyers or juries to define for them.

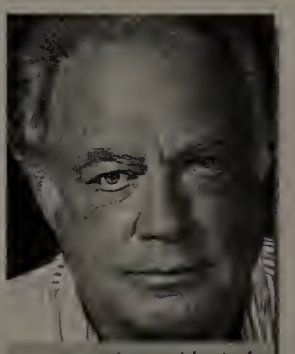
What happens in court is the judge gets 12 laypeople off the streets from widely varied backgrounds (who normally have little business or IT experience), and they decide what the supplier and customer meant by the words in their contract — all of them.

What's more, as a rule of thumb, you'll pay lawyers about $50,000 per word to try to tell the jury what some of those words really mean. You're charged for the lawyers' time (and their clocks run really fast), expert witness fees, court reporters, travel and lodging expenses, preparation, assistants, faxes, phone calls, word processing, free lunches and so on.

After 35 years total in this business, I'm absolutely convinced what a good contract for both parties is: a document that's so clear a disinterested third party of average intelligence can read it and — without coaching — completely understand what the deal is.

We should strive diligently to make both parties' contract compliance easily determinable by the parties. (What a concept.) Both customer and supplier should identify things like specific results to be accomplished, a measurable level of effort, statements of work (a detailed list of supplier "to-do's"), or any other way to objectively prove obligations have been fulfilled.

So, Keith, when there's a lot of painstakingly clear documentation of both parties' specific rights and obligations, the likelihood of a dispute even occurring is reduced dramatically. That's my experience, and thanks for asking. I love to get on my soapbox.



JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at **joea@dobetterdeals.com.**

Outsourcing Stories

I'd like to feature some good commentary about deserving outsourcing suppliers. Do you have a genuine, real comprehensive outsourcing success?

I'm somewhat skeptical in general, so . . .

How about: Are there any customers out there who have been "outsourced" for a few years and still believe the outsourcers are true "partners"?

How about: Do you feel like you gave the keys to the company store to someone who's trying to maximize their profits at your expense?

How about: Those of you who used one of the big-deal, big-name outsourcing lawyers or consulting firms (or both) to help do the deal — did they get you for big, big bucks and do a deal that didn't work right when the ink was dry?

Is there a major outsourcing customer out there who's willing to truthfully say, "Boy, this is great! We're so happy we did this?" I'd love to hear about it. E-mail me and we'll discuss your success stories — or painful learning experiences — for everyone's benefit.

Thanks. ◗

BRIEFS

Funding Raised

E-Steel Corp., a New York-based e-commerce business-to-business marketplace for the $700 billion global steel industry, recently raised an additional $66 million in its third round of financing. Backers include Goldman, Sachs & Co. in New York, General Electric Capital Corp. in Stamford, Conn., and Du Pont Co. in Wilmington, Del.

Online Billing

Southern California Edison (SCE) is working with Natick, Mass.-based edocs Inc. and Norcross, Ga.-based CheckFree Holdings Corp. to develop an electronic billing and payment service. The service is intended to enable SCE customers to view and pay their power bills over the Internet. San Francisco-based SCE plans to make the service available to residential and commercial customers sometime next year.

Health Care Industry

Santa Barbara, Calif.-based Tenet Healthcare Corp. and Mountain View, Calif.-based Chemdex Corp. formed a new business-to-business e-commerce company that will provide supply-chain services – procuring supplies and managing vendor contracts – to the health care industry. IBM Global Services in Tampa, Fla., will provide e-commerce and integration services to the new company's customers and suppliers.

Net Brokerages Gain

Full-service brokerage firms saw their average per-customer profits decline by 9% this year, while online brokerages and other self-service brokerages experienced a 25% gain in per-customer profits, according to a new report issued by Andersen Consulting in New York. The study, which measures per-customer profits and costs between mortgage companies and other financial services players, found that full-service brokerages had the highest costs per customer, at $834, while the average online or self-service broker spent just $348 to support each customer. Mortgage fund firms had the highest profits per customer, at $395.

Online Store

Millipore Corp. in Bedford, Mass., launched a new online catalog and store using e-commerce technology from Burlington, Mass.-based Open Market Inc. The company's new business-to-business Web site, *www.millipore.com*, includes detailed information about 7,000 of Millipore's scientific and technical products, plus online ordering and payment capabilities.

Intelligroup Spin-off

Iselin, N.J.-based Intelligroup Inc. will spin off its SeraNova Internet services unit into a separate company focused on developing business-to-business portals. The spin-off is expected to be completed by March, the company said. Raj Koneru, co-founder of Intelligroup, will be SeraNova's CEO.

Andersen Expansion

Andersen Consulting will pour $1 billion during the next five years into Andersen Consulting Ventures, a new venture capital unit that will fund Internet businesses.

The Palo Alto, Calif., unit will be headed by Andersen managing partner Jackson Wilson.

Outsourcing Deal

Inacom Corp. has announced a five-year outsourcing contract with Memphis-based Federal Express Corp. to build, configure and deliver FedEx PowerShip customer automated device systems to FedEx accounts.

Omaha-based Inacom will acquire and configure all PowerShip components to automate shipping, tracking and invoicing.

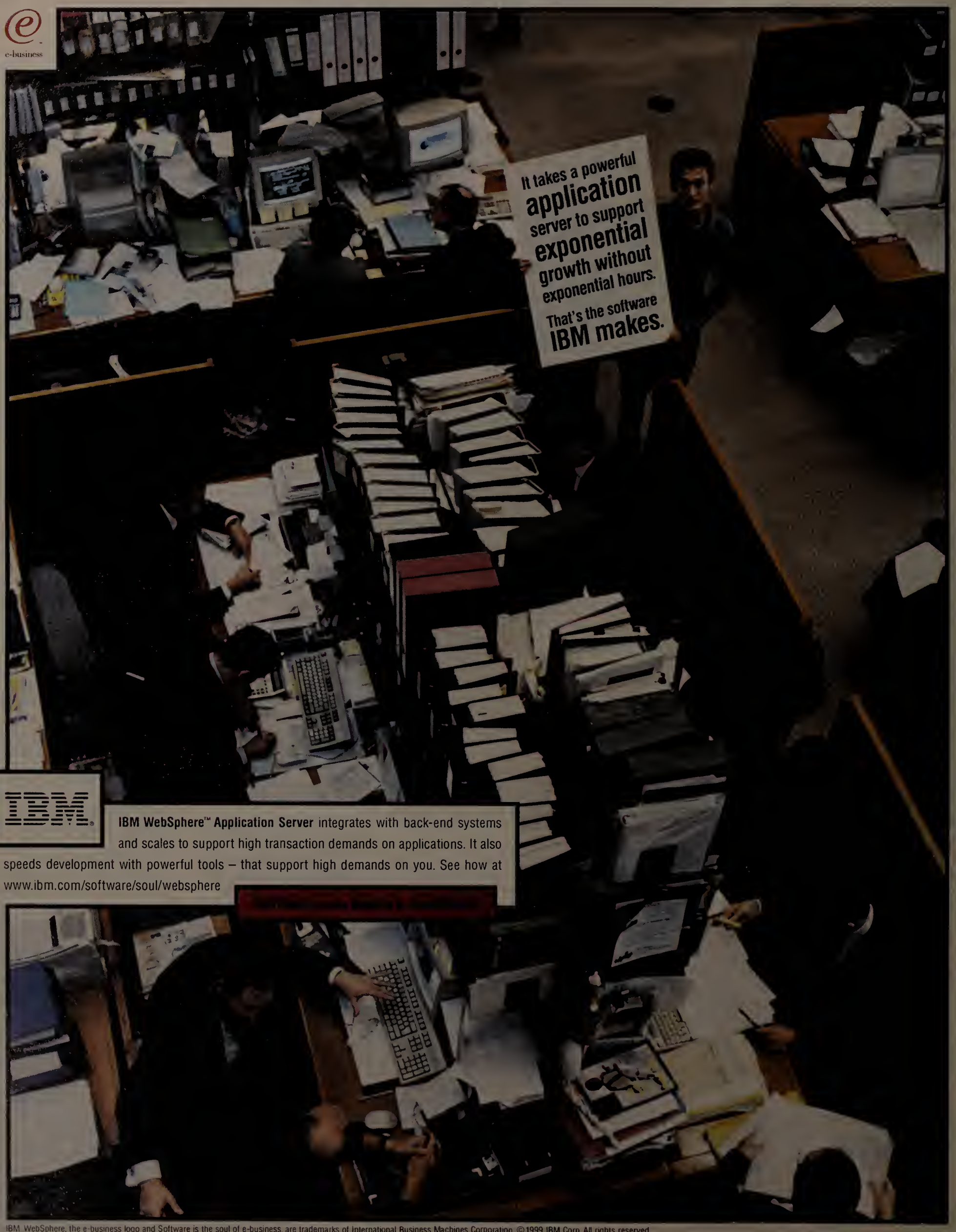
iVillage Adds Services

New York-based iVillage Inc., an online network for women, has selected Atlanta-based VerticalOne Corp. to provide a one-stop personal-account aggregation service to its approximately 7.1 million visitors.

The service is intended to help iVillage.com visitors better manage their financial and personal information with a single point of access to reward programs, communications, investments, credit-card and bank statements and other bills or personal accounts.

The service will be available free of charge to visitors of iVillage.com, beginning next month.

e-business



IBM

IBM WebSphere™ Application Server integrates with back-end systems and scales to support high transaction demands on applications. It also speeds development with powerful tools – that support high demands on you. See how at www.ibm.com/software/soul/websphere

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CLOGGING THE NETWORKS WITH HOLIDAY CHEER

The holiday season may be a time of good cheer, but for e-mail administrators, it's also a time for e-mail viruses and all those network-congesting electronic Christmas cards, multimedia Hanukkah greetings and New Year's GIF images. The proper policies and filtering tools can smooth out holiday mail headaches. ▸ 56

BIZTALKING

Microsoft wants badly to use its BizTalk specification for interoperability with rival platforms. But while customers are interested in what BizTalk could bring to the interoperability table, they'll remain cautious until problems such as Microsoft's ongoing antitrust woes and the lack of an XML-compatible BizTalk server are resolved. ▸ 56

HOT START-UPS: WHERE ARE THEY NOW?

Thirty-three companies have been profiled in our weekly Emerging Companies section since it began last April. Some of those companies have shot up the stock charts, while others haven't done as well. In this year-end roundup, we'll examine a few of the most active. ▸ 58

QUICKSTUDY

Web personalization technology is sizzling hot for corporate Web sites around the world. Knowing what your customers are likely to want ahead of time lets you tailor their Web experience precisely and possibly boost sales. But companies must balance the information they receive against customers' needs for privacy. It's not always easy. ▸ 60

FLASHBACK: END OF AN ERA

After documenting five decades of technology, we're finally up to date. The people who helped make the past 50 years happen pick their favorite moments. ▸ 66

JIM ARGO

IT WAS RANDY JO WILCOX'S birthday, but the CEO of BuyItNow.com didn't get the present she really wanted: a reliable Internet connection

4 E-SHOPPING DAYS LEFT — WHEW!

THIS IS IT. Christmas. It's been a year since e-commerce retailers wrestled the last holiday order into gift wrap and shut the door on what was, for some, a morass of crashed servers, dropped connections, partner failures and distribution errors. Now, after 11 months of planning, upgrading, repartnering and praying, the holiday sales riot is in full uproar.

62

BRIEFS

RailNet-USA Releases Version 2.0 Web App

RailNet-USA.com, a subscription-based Internet marketplace for the railroad contracting industry has released Version 2.0 of its proprietary, scalable Web application. The new version provides increased search-and-find capabilities, letting customers search vendors by such parameters as minority business status. It also lets users send documents and attachments in original format, transmit blueprints without special software, electronically transmit bids and verify transmission and receipt of all documents.

Over the coming months, RailNet-USA plans to roll out additional enhancements for users such as the Norfolk, Va.-based Norfolk Southern Railway Co. and Jacksonville, Fla.-based CSX Transportation, including a marketplace bulletin board and a conference and presentation center.

Delphi Predicts Jump In Portal Spending

The size of the market for software used to create corporate portals will grow to $740 million in 2001, compared with $178 million at the end of this year, according to The Delphi Group Inc. in Boston. The consulting and research group included in its definition of the market the software used to provide the architecture for the portal as well as tools used to conduct searches and store data.

Delphi's research showed that 55% of organizations surveyed already have portal projects in some stage of implementation, a figure that should rise to nearly 90% by the beginning of 2001.

Ipswitch Updates Windows Mail Server

Ipswitch Inc. in Lexington, Mass., has released Imail Server 6.0 for Windows NT. The updated version contains support for Secure Sockets Layer encryption to protect passwords and content for Web messaging. The product also offers password-protected list-server controls, remote administration tools, antispamming capabilities and support for authenticated Post Office Protocol. Pricing starts at $995 for 250 users.

Organizations Face Holiday E-Mail Attachment Deluge

Proper policies, tools needed to prevent network delays and virus transmission

BY LEE COPELAND

IT'S THAT TIME of year. Once again, holiday greetings start arriving by e-mail. And once again, a slew of cute attachments threatens to clog and bring down mail servers.

Many corporations face an annual attachment deluge during this season in the form of graphics interchange format (GIF), executable (.exe) and MPEG files. While users enjoy listening to one-eyed aliens sing Aretha Franklin tunes and watching Santa bowl with elf pins, these attachments may slow network responsiveness and carry viruses.

Although one large attachment won't cause network delays, "the problem is one person gets some little, cute executable and then forwards it on to 20 of their friends," said Neil Horan, MIS manager at accounting firm Two Degrees LLC in Seattle. "Ninety-nine percent of the time, [playing with the attachment] just eats into their work time, but the bigger concern is that it has a malicious virus on its back end."

Two Degrees routes all of its Internet mail through Allegro Inc.'s MailZone, which filters out unwanted attachments, viruses and spam. Dayton, Ohio-based Allegro is offering free e-mail filtering until mid-January. Pricing for the service usually starts at $1 per mailbox per month.

Richard Bliss, vice president of marketing at Allegro, said opened attachments with strong sexual connotations, such as the anatomically correct snow people that appeared last winter, could present a legal liability issue.

"Companies need to ask themselves: 'Do we have a legitimate business reason to have e-mail executable attachments or MP3 files?' " he said. "If they don't have a strong justification, then these have to go. If you educate your workforce, the problem goes away in a hurry."

To lick the problem of overly zealous holiday .exe- and GIF-giving, analyst David Cearley at Meta Group Inc. in Stamford, Conn., suggests companies set policies before they install filtering technology.

"IT organizations don't need to start with technology but with e-mail policies of what is allowed and not allowed," he said. "They should only move to a technical solution when it becomes a significant problem. It's hard to tell what the attachments are, and some things are going to squeeze by."

Corinne Peterman, senior network analyst at Georgetown University in Washington, said auto-response loops wreak the most havoc over the holidays. Many vacationing students, faculty and staff set their GroupWise e-mail accounts to automatically return a message stating that they are on break.

"Some users create the vacation rule improperly," Peterman said. "They set it to reply to every incoming message. If they reply to a list of 50 people, and if one or a couple of those people also have a vacation rule in place, it turns into spam." ◗

Top E-Mail Attachment Clogs Of December '99

FILE NAME	SIZE (BYTES)	CONTENT
Elfbowl.exe	1,525K	Santa bowls, and his elves serve as pins
Snowcraf.exe and snowball.exe	2,808K	Two teams of kids have a snowball fight
Frogpult.exe	1,400K	Catapult a frog to a lily pad or it gets eaten by an alligator or piranha
Tree.exe	2,588K	Decorate tree with ornaments, lights and presents
Xmas.exe	1,111K	Christmas trees, wreaths and presents, with Madonna's "Holiday" playing in background
Workshop.exe	2,552K	Elves in Santa's workshop assemble toys under the whip
Redneck.exe	1,094K	" 'Twas the Night Before Christmas," with mentions of trailers and gun racks

SOURCE: ALLEGRO INC., A DIVISION OF MAIL.COM INC., NEW YORK

Microsoft Finalizes BizTalk XML Standard

But lack of server has hampered users

BY DAVID ORENSTEIN

Microsoft Corp. earlier this month settled on the 1.0 version of the BizTalk.org specification for Extensible Markup Language (XML), but observers said implementation of the specification depends on the release of Microsoft's BizTalk server and even the outcome of the government's antitrust case.

The specification describes how businesses can design systems to share XML documents and other XML-tagged data among their applications. BizTalk.org, which includes major users and vendors, is one of several organizations that hope to make XML the language of business-to-business e-commerce.

The potential to link manufacturing and supply-chain applications has kept Philip Morris U.S.A. interested in BizTalk.org, said staff engineer Ken Forster. He has been following the specification's evolution in BizTalk.org's newsgroups.

The New York-based company will study the specification, Forster said, but, "we're really waiting for the BizTalk server." The company, he said, doesn't want to create its own tools to begin working with XML.

The lack of tools such as the BizTalk server, due from Microsoft in the first half of next year, has hemmed in users' ability to make use of the work at BizTalk.org, said analyst Ron Exler at Robert Frances Group Inc. in Westport, Conn.

But BizTalk is the linchpin in Microsoft's stated strategy to use XML to make applications running on Windows interoperable with those that run on other platforms, said Adam Braunstein, Exler's co-worker. Braunstein said Microsoft has become more interested in making Windows genuinely interoperable with other platforms as the antitrust case has become more of a threat to its dominance.

If the government succeeds in toppling Microsoft's monopoly, he said, the company will need XML to make its products open to rivals. "If they are forced to compete in an open world, you can be sure they will compete," he said. ◗

MOREONLINE

For more resources on XML and Microsoft, such as articles, FAQs and papers, visit our Web site.

www.computerworld.com/more

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Emerging Companies Roundup

We check in to see how our first year's EC picks have fared

SINCE OUR FIRST LOOK AT AN emerging company in April, *Computerworld* has chosen 33 worthy of attention from information technology managers. A lot has happened since we began; many of the companies in our weekly profile were also a part of our special Top 100 Emerging Companies 2000 supplement last month.

Six are now publicly traded on U.S. stock exchanges; Preview Systems' initial public offering (IPO) earlier this month has since more than tripled its opening price. Two of our companies have been acquired. And — oops — a couple have fallen on hard times. Here's a look at what's happened to some of our most active Emerging Companies to date:

RANDALL SCOTT

Jeff Hussey, F5 Networks' CEO

F5 Networks Inc.

www.f5.com
Trading symbol: FFIV
Profiled: Oct. 25
Business: Web server load balancing
Chances: ↑
F5 Networks' Big IP and 3DNS family of Web server load-balancing systems was designed to keep critical Web sites up through the heaviest traffic. That's why we thought it ironic that Encyclopaedia Britannica.com, F5's poster child for load-balancing success, died under heavy traffic about the same time that F5's great balancing act earned it a place as a *Computerworld* Emerging Company.

About 20 times the normal user volume responded to the company's new free access policy and flooded Britannica.com before backup servers could be wheeled into place. Administrators were forced to shut down the site.

There's a lesson there, says Doug Shuck, Britannica's executive director of online sales: Exceptional load-balancing capabilities don't matter if you don't have enough servers. "F5 wasn't the problem," he insists. "If the underlying software architecture had scaled the way I wanted it to and we had enough machines to handle the load, we would have been fine."

Britannica.com has since added 64 new Web servers and 12 dedicated database/search servers, and F5 has accepted the increased capacity smoothly, with no further mishaps. That's been about the only misstep for F5, which also made it to our Top 100 Emerging Companies for 2000 list. The company has added some impressive new partners, including portal builder Aventail Corp. and 3Com Corp. And it shipped global/SITE Controller, a content replication and distribution system, last October to good reviews.

F5's customer roster continues to grow; Hewlett-Packard Co.'s new photo Web site, Cartogra.com, Bass Hotels, Intuit Corp. and the investment site MotleyFool.com now use F5 equipment. Company stock has gone from $14.88 per share on IPO day in June to about $120 per share.

BUT . . . Competitors like RADware Inc. are fast waking up to the hot demands for Web server load balancing. RADware, which formerly concentrated on balancing loads on private networks and across firewalls, just signed an agreement to produce Internet-specific balancing products with Internet appliance maker Network Engines Inc. And Alteon Websystems Inc. last month announced a new "granular" load-balancing service based on cookies. Called "cookie cutting," the new technology will let site administrators classify users and shift them to high- or low-volume Web servers as needed.

The 800-pound gorilla in this space, Cisco Systems Inc., continues to expand its load-balancing offerings. It partnered with HP to produce Dynamic LoadDirector, a Web-specific load balancer that uses HP's ServiceControl QoS product and HP-UX servers. It's already in place at GardenBotanika.com, according to a company spokesman. — *Amy Helen Johnson*

BIZRATE'S HENRI ASSEILY and Farhad Mohit

BizRate Inc.

www.bizrate.com
Profiled: May 10
Business: E-commerce site rating service
Chances: ↑
BizRate relies on results from surveys customers take when they buy a product; if electronic retailers refuse to participate, the company offers a much less effective independent review of the site. Since our profile, the company has gained support from giants like CDNOW.com, which improve its chances. BizRate has added a click-through discount service and comparison-shopping systems, and the company has partnerships with reviews veteran *Consumer Reports* that should attract new shoppers. BizRate certainly attracted new investors; it closed a second venture capital round of $20 million late last summer.

BUT . . . Major electronic retailers such as Amazon.com Inc., Barnesandnoble.com LLC, Dell Computer Corp. and The Gap Inc. still aren't playing the BizRate game, which makes the service much less useful. And while the company's fledgling electronic-market analysis service is beginning to be a hit with corporations, ratings veterans like Nielsen Media Research and newcomers like BuyerTouch Inc. crowd the field with great offerings.
— *Cynthia Morgan*

Bowstreet Software

www.bowstreet.com
Profiled: June 28
Business: XML-based data management systems
Chances: ↑
Bowstreet brought out its Web Automation Factory environment last month with Microsoft-style hoopla, but this quarter-million dollar tool kit may really deserve that much. The XML-based system lets IT managers build business-to-business commerce sites and content classification systems relatively quickly, using a Bowstreet-inspired directory classification system known as Directory Services Markup Language (DSML). DSML has the blessings of IBM, Microsoft Corp., Red Hat Software Inc. and Nortel Networks. (To learn more, see "Software Builds Custom Sites" in our Nov. 15 issue.) That, and promising first sales, landed the company an additional $20 million in second-round financing.

BUT . . . The jury's still out on how quickly IT managers will embrace XML/DSML.

BroadQuest Inc.

www.broadquest.com
Profiled: July 19
Business: Customer relationship management (CRM) portal
Chances: ↓
Since our profile on BroadQuest appeared, the CRM portal has gone from an interesting idea to a standard for centralizing service and support. Enterprise resource planning (ERP) and CRM software makers have joined in the quest for webified customer management. BroadQuest, however, has had trouble getting new products off the ground and has "kept an intentionally low profile until we have something to talk about," says Thomas Reilly, vice president of sales. New products, partnerships and customer wins will be announced late next month, he adds. — *Cynthia Morgan*

Brocade Communications Systems Inc.

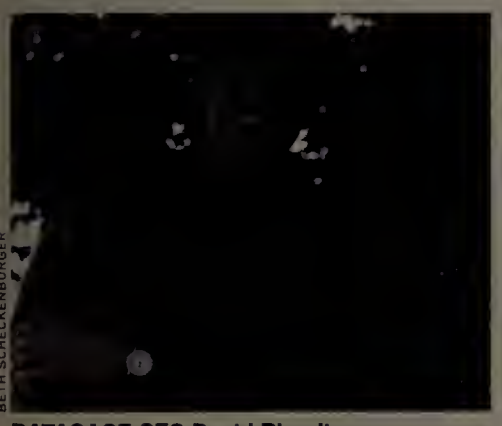
www.brocade.com
Trading symbol: BRCD
Profiled: Sept. 13
Business: Fibre Channel switches for storage-area networks (SAN)
Chances: ↑
The storage business, especially Fibre Channel SAN technology, couldn't be hotter. Brocade just had a 2-for-1 stock split and is still climbing the charts with a good quarterly report. The company has broadened its supplier base with three new manufacturers, EMC Corp./Clariion, NEC Corp. and Silicon Graphics Inc., and added a longtime Ancor customer, Hitachi Data Systems, to its ranks. Brocade is adding entry-level SANs to its market. The company introduced SilkWorm 20x0 switches as an alternative to managed hubs.

BUT . . . The rising popularity of Fibre Channel and better interoperability will continue to weaken Brocade's overwhelming market dominance. Brocade remains a strong player — but attention-worthy competitors abound. Intel just invested $14.8 million in rival Ancor Communications Inc. for development of a new line of InfiniBand server clustering switches that will pair well with its Fibre Channel offerings. — *Cynthia Morgan*

Cha Technologies

www.1clickcharge.com
Trading Symbol: CMGI
Profiled: July 26
Business: Electronic payments systems
Chances: —
Acquired by Internet megaconsolidator CMGI Inc. in September, which quickly moved to incorporate Cha's 1ClickCharge into the payment systems of its many subsidiaries and partner companies. CMGI has also given Cha a strong kick in the business development, bringing in a hot new partnership negotiator.

BUT . . . Though everybody agrees that micropayments are the future for small Web-based transactions, the entire genre continues to struggle with customer acceptance. Pioneer First Virtual Holdings and Digicash Inc. are gone, and MasterCard Mondex is struggling. (To learn more, see "Big Dreams for Tiny Money" in our Dec. 13 issue.) — *Cynthia Morgan*



BETH SCHECKENBURGER

DATASAGE CEO David Blundin

DataSage Inc.

www.datasage.com
Profiled: Sept. 6
Business: E-commerce personalization
Chances: ↑
DataSage, an electronic-marketing analysis vendor, has grown enormously. The company posted a 1,000% growth rate in its fall quarter sales. A key deal with Web commerce developer OpenMarket Inc. to add its netCustomer analysis tools to IPS Content Management system should bring in much-needed new partners. And the company added a new I-Mail Link program for custom direct e-mail marketing campaigns.

BUT . . . The electronic-market field is becoming more than crowded and a hot target for consolidation. DataSage may have to go lean and mean to survive the coming shakeout in this very competitive field. — *Cynthia Morgan*

Digital Lava Inc.

www.digitallava.com
Trading symbol: DGV
Profiled: July 12
Business: Video publishing software and services
Chances: ↓
Digital Lava's IPO, priced at $15.10 per share last February, recently sold for as little as $3. The reasons for the skid are probably out of the company's control, unfortunately: Online video learning systems, a key business for Digital Lava's offerings, are becoming one of the hottest technology categories around. And the heavy training requirements of new Web- and XML-based products, coupled with Windows 2000's Feb. 17 debut, will only exacerbate the need. That's more than enough to attract deep pockets like IBM/Lotus Development Corp., Oracle Corp., Microsoft, RealNetworks Inc. and the Big 5 consultants, not to mention more modest competitors like Eloquent Inc. and LiveNote Inc.

— *Cynthia Morgan*

Ironside Technologies Inc.

www.ironside.com
Profiled: Sept. 27
Business: Business-to-business commerce for manufacturers and distributors
Chances: ↑
Ironside just released a new edition of its business-to-business e-commerce server; this one offers tight integration with GEAC/JBA's ERP system, making it the 14th such package to hit the corporate streets. That's one reason the company netted $28.5 million in a third round of venture capital funding this fall. The company has embarked on a program to tailor its products to specific vertical industries, such as electronics components.

BUT . . . Ironside is still struggling to find a way to boost the dazzle factor of its cataloging software. And some of its deals are beginning to encroach on the territories of OpenMarket and other major business-to-business players.

— *Cynthia Morgan*

Personify Inc.

www.personify.com
Profiled: April 26
Business: Electronic marketing
Chances: ↑
Personify is taking the next big step: turning Essentials, its rather pricey electronic marketing tools, into a rentable application service. The company has already begun providing application service provider-like electronic marketing to one customer, Volvo America. The move has apparently paid off; Personify closed an $18 million deal in second-round funding. It's also acquired data-mining toolmaker Anubis Solutions Inc., a move that will strengthen its ability to scrape every bit of analysis out of the massive amount of site visitor data that Essentials collects.

BUT . . . Personify still needs to beef up offerings that marry click-stream information to back-end pre- and post-sale information analysis. Companies like DataSage Inc. — another emerging company — still have the edge there.

— *Cynthia Morgan*

Pilot Network Services Inc.

www.pilot.net
Trading symbol: PILT
Profiled: June 7
Business: Outsourced commerce and enterprise network security
Chances: ↑
When we last wrote about Pilot, the company had dug deep into its publicly funded pockets to finance a broad international expansion. Pilot got the nod from marketing strategist Aberdeen Group Inc. last month, which applauded the company's customers for sticking to core businesses and outsourcing to Pilot to eliminate "the unacceptably high cost associated with managing security internally."

BUT . . . It takes only one serious breach among Pilot customers to destroy the very delicate balance of trust that Pilot has built. Skilled security experts are hard to find; Pilot's rapid expansion could strain resources severely. — *Cynthia Morgan*

Preview Systems Inc.

www.previewsystems.com
Trading symbol: PRVW
Profiled: June 21
Business: Digital soft goods distribution
Chances: ↑
Preview Systems tripled its opening price at its IPO earlier this month. The company has added high-tech distribution giant Ingram Micro Inc. to its customer list and is heavily involved in the burgeoning electronic-music business with record companies such as EMI Group PLC and Sony Corp.

BUT . . . Electronic distribution, particularly when it comes to music, is simply too big. Preview's business is already attracting hungry sniffs from the likes of AT&T Corp., current-customer Microsoft and IBM. Preview will need every penny of its IPO stake just to stay in the game with these giants.

— *Cynthia Morgan*

Proxinet Inc.

www.pumatech.com
Trading symbol: PUMA
Profiled: Aug. 30
Business: Web browsing for on- and offline devices
Chances: ↑
Handheld management company Puma Technology Inc. acquired Proxinet in October. Maker of the Intellisync synchronization systems for Palm OS and Windows CE devices, Puma is also acquiring NetMind Technologies Inc., which builds Web tracking and alert software. The combination means Puma will be able to offer handheld users an on-the-go Web and e-mail update system.

BUT . . . Proxinet's flagship ProxiWeb browser still lacks Java and JavaScript support and offers only 40-bit DES encryption. — *Cynthia Morgan*

GARY LAUFMAN

SOLSOFT FOUNDER and President Jerome Fougerat

SolSoft Inc.

www.solsoft.com
Profiled: Aug. 9
Business: Intranet/extranet security
Chances: —
The Buzz: Solsoft is still working to add important standards support to Net Partitioner, its policy-based security management system. The company added the ability to work within Cisco's CiscoWorks 2000 network management system last fall, and promises to support full audit/edit of Cisco's access control lists in a future version. A Java version is due soon.

— *Cynthia Morgan*

XACCT Technologies Inc.

www.xacct.com
Profiled: June 14
Business: IP network usage metering
Chances: ↑
XACCT has gone to the venture capital well three times, the last for $21 million in late October. Partnerships, particularly with Cisco, have flourished, and XACCT has roughly doubled alliances since our profile. The company still does more business among major network service providers than rival Narus Inc.

BUT . . . Narus shares many XACCT partnerships and has one that XACCT doesn't: a close alliance with Sun Microsystems Inc. and Netscape Communications Corp. Plus, the August debut of HP's Smart Internet Usage Version 2.0 proved that HP could pack a powerful punch in IP usage management.

— *Cynthia Morgan*

Web Personalization

BY TIM OUELLETTE

ARE YOU GETTING the most out of the Web, or is the Web getting all it can out of you? That's the question the e-commerce industry is wrestling with as Web personalization technology takes off.

The potential is great: With Web personalization, users can get more information on the Internet faster because Web sites already know their interests and needs.

But to gain this convenience, users must give up some information about themselves and their interests — and give up some of their privacy.

Web personalization is made possible by tools that enable Web sites to collect information about users.

DEFINITION:
Web personalization involves tailoring Web content directly to a specific user. This can be accomplished by having the user provide information to the Web site directly, or through tracking of the user's behavior on the site. The software on the site then can modify the content to the user's needs.

Matching Users' Needs

One of the ways this is accomplished is by having visitors to a site fill out forms with information fields that populate a database. The Web site then uses the database to match a user's needs to the products or information provided at the site, with middleware facilitating the process by passing data between the database and the Web site.

An example is Seattle-based Amazon.com Inc.'s ability to suggest books or CDs users may want to purchase based on interests they list when registering with the site.

"Customers tend to buy more when they know exactly what's available at the site and they do not have to hunt around for it," says Chris Locke, an editor at Personalization.com, a Web site dedicated to Web personalization issues.

Cookies may be the most recognizable personalization tools. Cookies are bits of code that sit in a user's Internet browser memory and tell Web sites who the person is — that's how a Web site is able to greet users by name.

YAHOO uses cookies to gain information needed to personalize users' My Yahoo pages

A less obvious means of Web personalization is collaborative-filtering software that resides on a Web site and tracks users' movements. Wherever users go on the Internet, they can't help but leave footprints. And software is getting better at reading the paths users take across the Web to discern their interests and viewing habits: from the amount of time they spend on one page to the types of pages they choose.

Collaborative-filtering software compares the information it gains about one user's behavior against data about other customers with similar interests. In this way, users get recommendations like Amazon's "Customers who bought this book also bought. . ."

Corporate information technology professionals may find that Web personalization cuts the time it takes to purchase IT equipment because vendors' Web sites may already be tailored to their needs, says Laurie Windham, CEO of Cognitiative Inc., a consultancy in San Francisco. "Customers can order whenever they want, and they have more control over how the relationship with their vendor works," she says.

Windham cites Dell Computer Corp.'s practice of allowing users to create their own personal "Dell sites," which allow the Round Rock, Texas-based company to offer special prices and deals to users based on the information about their computing needs and interests they provide when they set up their sites. Users can then buy exactly what they need at their leisure without having to call a representative, hunt down the products available and then try to work out deals.

Privacy Concerns

But right now, the privacy issue still hangs over industry players. Some companies abuse the information they receive from users, resulting in that most hated product of Internet commerce: spam.

Because of junk e-mail, "people are getting increasingly skeptical about what's happening with the information they provide to some Web sites," Windham says.

But Locke says he doesn't think privacy concerns will be a problem very long because companies that abuse user information won't see long-term success — word travels fast on the Internet about these types of practices.

"The larger issue is, what will convince people to put up with and voluntarily engage in Web personalization is going to be the value they receive back for the information they provide," Locke says.

In the future, observers like Locke and Windham say they expect to see more advanced technology like neural networks helping e-commerce sites learn even more about their customers' behaviors.

And sites are creating whole new ways for users to share and gain information, says Locke. Amazon.com, for example, offers "purchase circles" where users with similar tastes can hook up and discuss books and music they like. ◗

Ouellette is a freelance writer in Scarborough, Maine.

Types of Web Personalization Approaches

TYPE	WHAT IT DOES	VENDORS/ EXAMPLES
Cookies	A tag on the Web browser identifies the user to the Web site.	Yahoo Inc.'s My Yahoo pages
Check-box personalization	User checks interests on a checklist so the site can present the proper information. This is a user-controlled process.	Site-specific
Collaborative-filtering software	Tracks user behavior and compares it with that of others who have visited the site.	Net Perceptions Inc.
Rules-based systems	Use business rules to deliver certain types of information based on a user's profile, dividing users into segments based on these rules.	Broadvision Inc.

Web Resources

The following Web sites provide additional resources for further review of Web personalization technology:

Accelerating 1 To 1 (*www.accelerating.com*): This site includes articles on Web personalization issues like privacy and offers reviews of Web personalization software.

Personalize.com (*www.personalize.com*): A Web site chock-full of articles and opinions on the various types of Web personalization approaches and the issues facing the use of the technology.

Cognitiative (*www.cognitiative.com*): A consulting company Web page that specializes in e-commerce issues.

Appian Web Personalization Report (*www.appiancorp.com/awpr.asp*): An online newsletter sponsored by Appian Corp., an e-commerce vendor. It features articles on the latest developments in Web personalization.

The Unofficial Cookie FAQ (*www.cookiecentral.com/faq/*): A good resource for learning more about Internet cookies, what they do and how they do it.

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Kevin Paugh, CIO
Advantage Sales and Marketing

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We go on-site to find out how well online retailers learned from last year's mistakes

By Mathew Schwartz

AT SMARTERKIDS.COM INC., an online educational and developmental toy retailer in Needham, Mass., Vice President and CIO Rich Secor is making his list and checking it twice. Last year, for a period of four hours, consumers who were making orders at his site suddenly had their transactions aborted due to a technical glitch with a third-party credit-authorization bureau. When the bureau failed, so did SmarterKids.com's ability to accept online orders.

"The most important lesson that I learned last year was to never let your site depend upon someone else's online service or content," Secor says. This year, his company is checking credit asynchronously.

In Tulsa, Okla., at BuyItNow.com LLC, an online retailer with 14 online stores selling everything from jewelry to electronics, Vice President of Organizational Development John Meek has a wish: to find an Internet service provider that can give his firm better service and strengthen the network his call center people rely on to input orders.

Just northwest, at online toy retailer KBkids.com in Denver, founder and CEO Srikant Srinizasam got his present early this year: easier distribution. Previously, the company was a virtual store — it carried no inventory and used five different distribution sites to ship orders. "We found that when push comes to shove and you're looking at really high volumes, you don't have the same level of control over distribution," Srinizasam says. In May, the company outsourced fulfillment to Weehawken, N.J.-based Hanover Direct Inc. and finally had its two enterprise resource planning (ERP) systems integrated by September.

This holiday season, *Computerworld* examined the scaling efforts of these three popular online retailers — SmarterKids.com, BuyItNow.com and KBkids.com — to see how they have planned infrastructure changes to meet an onslaught of online holiday buying. At stake? The potential for incredible revenue, balanced by the imminent threat of systems failure, resulting in incredible loss of revenue.

During this holiday season, Jupiter Communications Inc. in New York forecasts that U.S. consumers will spend $6 billion online, making an average of 58,000 transactions per day at top sites in November and December, up from 29,000 per day last year. But the National Retail Federation has found that only 35.4% of unique users who surf a retail site ever buy something from it, which means 64.6% of site resources used

SURVIVI
E-CHRISTM

don't end in a transaction. So it's no surprise that people at all three companies interviewed are losing lots of sleep over infrastructure, fulfillment, the best way to analyze and monitor their sites and how to achieve reliability.

Ready Infrastructure

To tackle Web fulfillment, BuyItNow.com created its ERP system in-house, figuring that integrating its systems with those of 1,000 suppliers obviated an out-of-the-box solution.

The company opted for burstable T1 pipes — connections that expand to match traffic needs up to a full 1.54M bit/sec. — between its offices, so that site analysis and updating doesn't steal bandwidth from customers surfing the site and conducting transactions. A new, homegrown Java application handles loading content onto the site. At each of three sites, the company relies on Sun Microsystems Inc. 250 Network File System servers to control a Solaris test server for staging, two dual-processor Web servers at each location and a Sun 450 database server running Oracle.

The SmarterKids.com team runs their site off of Windows NT and related products, such as Microsoft Corp.'s

Continued on page 64

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MISSED CONNECTIONS

Computerworld writer Mathew Schwartz spent 24 hours in the Tulsa, Okla., offices of electronic retailer BuyItNow.com LLC.

PHOTO CREDIT

RANDY JO WILCOX must carefully balance Web system demands with marketing efforts

WEDNESDAY, DEC. 1

Riding south on State Highway 169, I crest a hill – a small one; this is prairie country – and turn off into a small shopping plaza. Next to Johnny's Deli, a small collection of signs includes the name BuyItNow.com.

3:10 P.M. I shake hands with Randy Jo Wilcox, co-founder, president, chief operating officer and an energetic, enthusiastic and technologically savvy presence. When she founded the company, she coded Web pages and wrote SQL queries. Today's her birthday, and the office is filled with cards. "It's good to be Queen," one reads.

3:30 P.M. I meet John Meek, vice president of organizational development. Meek's in charge of the integrated voice response (IVR) system. Like many online retailers, BuyItNow.com has a toll-free number and a staff of "e-reps" to answer questions and take orders. Unlike older IVR systems, Meek says, his can be reprogrammed in about four hours.

4 P.M. Radio shrink Dr. Laura Schlessinger has promised to plug BuyItNow.com's toy drive that night on *The Tonight Show* with Jay Leno, so night traffic is liable to be heavy. Meek begins to reprogram the IVR to cope.

6 P.M. BuyItNow.com's chairman of the board needs a product for DJ Rick Dees at KIIS-FM in Los Angeles. On Thursday, Dees will plug the product on the "Dees Deal of the Day" segment of his show. Wilcox lines up a diamond-stud-earring supplier in 30 minutes.

7:30 P.M. The Internet connection dies. IoNet Inc., Oklahoma's largest Internet provider, has somehow dropped the link. The consumer site is fine, but back-end processes such as order entry and fulfillment must be done off-line until the Internet connection resumes.

7:45 P.M. What's needed now are warm bodies to man the phones and process orders. Wilcox dashes through the 30,000-sq.-ft. office. "Calling all e-reps!" she yells. Former e-reps now working in IT or operations are recalled.

8:30 P.M. Still no Internet service. Wilcox goes home and logs in through her home EarthLink Network Inc. account, using her laptop's modem. She'll keep in touch with IT via cell phone for the rest of the night.

9:45 P.M. It pays to monitor: IT determines that a faulty router brought down the Internet connection. But that touches off a frustrating round of buck-passing; the router is co-owned by Cable & Wireless PLC and co-located at PSINet Inc. by a PSINet subsidiary, Rocky Mountain Internet in Denver. So information systems director Mark Koopmans and his team scream all the way to the top, to ioNet's COO. Koopmans threatens to sue. A meeting with the ioNet CEO is scheduled.

11:30 P.M. Leno pulls in 13.9 million viewers on a Wednesday night, and it shows. After Schlessinger's plug, the phones light up.

CW ON-SITE

THURSDAY, DEC. 2

12:30 A.M. Wilcox updates the site to include information for the Rick Dees earrings. Site indexing is through for the day – it automatically kicked in at midnight – so an IT person will have to update the index manually. The first few don't answer their company-provided cell phones. Wilcox fumes; they're supposed to be available 24 hours per day. "Pick up or you won't have a job tomorrow!" she jokes on their voice mail. Someone finally answers.

3:30 A.M. The e-reps go home three hours later than usual, but they've caught up on their e-mail. It's normally answered in 20 minutes, but over the holidays the response time hovers near 12 hours.

7:20 A.M. Rick Dees' show airs. He mentions the earrings but directs people to the toll-free number, not the URL. The phones go crazy. Meek quickly reprograms the IVR, plugging the Web site as an alternative to customers on hold.

8:30 AM. Six e-reps are in the hospital with a vicious strain of pneumonia, so all those still standing are recalled for duty. Their compensation: After three months of employment, they get stock options. Not a lot of other companies in Tulsa do that.

12:02 P.M. "I got a Web page!" someone in the call center yells. Internet service is back, but it's incredibly slow.

4:05 P.M. Toy donation instructions are confusing customers, so operations manager Melissa Marsh and datagraph director Teresa Miles huddle in Miles' office to fix the situation. "I don't think they meant to send DVDs to the kids," Miles says. Problem solved, but customers must now log out to get a discount on personal purchases.

4:15 P.M. The faulty router has finally been fixed. While network degradation persists, at least the staff can use their computers.

8 P.M. I head to the airport. BuyItNow.com's executives are finally heading home.

– Mathew Schwartz

SURVIVING E-CHRISTMAS

Continued from page 63

Site Server Commerce Edition. But because of scalability concerns and a burgeoning data load, Secor is considering a switch to Oracle8i.

KBkids.com also went more out of the box. The company uses Sun 4500 and 6500 enterprise systems, along with Oracle8i, to run the WebOrder enterprise system from Delray Beach, Fla.-based Smith-Gardner & Associates Inc. It's an unconventional choice; the tool is mostly used by large catalog retail companies.

"What attracted us to the system was the fact that it could handle large volumes [and] had very good customer service applications built in, as well as the financials to keep track of where the money was going," says Srinizasam. He also hired a Smith-Gardner programmer who had maintained the system in a 200,000-orders-per-day environment.

Analyze This

Taking into account last year's mistakes, retailers this year started preparing early to make sure their sites could scale to meet the holiday shopping fever. As Jupiter analyst David Schatsky noted, risk management dictated that all infrastructure enhancements had to be done by November to reduce the potential for site instability in time.

And, contrary to popular myth, scalability doesn't just involve adding new servers when things slow down. As a recent survey from Barnstable, Mass.-based Newport Group Inc. found, software — application server, Web server and database — causes crashes more often than hardware does. Director of research Billie Shea says obsolescence is to blame. "A tool that you used six months ago might have been upgraded or changed," she says. As a result, many sites are "forced to update that while handling high levels of growth."

Understanding when and how to augment the site requires sophisticated analysis tools, and all three companies use them — religiously. KBkids.com uses LoadRunner, an Internet testing tool from Mercury Interactive Corp. in Sunnyvale, Calif.

Based on daily analysis provided by the net.Analysis product from net.Genesis Corp. in Cambridge, Mass., SmarterKids.com uses a formula to predict site needs. BuyItNow.com chose the same tool, partially because it was the only product that could stitch together three server log files, which otherwise would require three different information technology people.

Most companies keep hardware and software well below 100% capacity. At BuyItNow.com, the IT staff developed a reporting system that monitors site traffic and fires off alarms when thresholds are exceeded. "At 20% resource usage on a database server, you have to optimize the system immediately, before an unexpected breakdown," says President and Chief Operating Officer Randy Jo Wilcox. "With Web servers, it is different. At 40% usage, it's easy to throw up another Web server."

"The input/output on databases require a lot of resource. A 70% drag on a database machine is going to get you about 30% of optimal response time. On a graphics-intensive site like BuyItNow's, that's too slow," Wilcox says.

But not every problem is predictable. That's why companies also use real-time monitoring tools. SmarterKids.com subscribes to a service from Keynote Systems Inc. in San Mateo, Calif., that continuously monitors its Web site from different global locations. "I can see every 15 minutes what our page load times are around the world, and by looking at those and setting up alarms with their service, I'll know where we're having problems," Secor says.

Site surveillance is also useful for detecting whether someone has broken into the site or if some element of a Web page won't load. For that, SmarterKids.com uses e-Monitor from RSW Software Inc. in Boston and Enterprise Monitor from MediaHouse Software Inc. in Hull, Quebec. Both pieces of software continuously monitor the Web address and notify the company if anything has been changed or won't load.

To ease content distribution, SmarterKids.com also opted for content distribution services from Akamai Technologies Inc. in Cambridge, Mass. Akamai caches Web pages in its global servers to speed download of graphics-intensive sites. Though only half-done with the implementation, SmarterKids.com tests show that consumer download times for its site have been reduced by up to 50%.

All the monitoring in the world won't help if an earthquake eats your data center, so all three companies co-locate their data servers. The thinking behind co-location is simple: Besides more effectively load-balancing your network, if the server in San Francisco goes down, the one in Washington can cover.

The Fulfillment Nightmare

Don't forget distribution: According to Stamford, Conn.-based Gartner Group Inc. and Cambridge, Mass.-based Forrester Research Inc., it's the single biggest point of failure in e-commerce. The best-scaling Web sites in the world are useless if they run out of inventory or if their goods can't get delivered.

BuyItNow.com carries virtually no

> I can see every 15 minutes what our page load times are around the world, and by looking at those and setting up alarms with their service, I'll know where we're having problems.
>
> RICH SECOR, VICE PRESIDENT AND CIO, SMARTERKIDS.COM INC.

Site Scalability in 7 Steps

With so many variables, how do you know when to upgrade your servers, routers or processors? Faced with this daunting task, SmarterKids.com CIO Rich Secor developed a formula for knowing which systems to upgrade at the Web site, and when. Though he wouldn't give us trade secrets, he did reduce his secret formula into some general steps that any scalability-seeking Web site company can follow:

1. Take a revenue forecast for the Web site and break it down into different performance periods.
2. Predict future dollars per order by projecting from historical dollars per order.
3. Determine projected site visitors per performance period by dividing each period's financial forecast by projected dollars per order.
4. Next, predict peak activity in much shorter-term periods. Analyze many order rates over very short-term intervals and derive a statistical bias to apply to projected site visitors.
5. Obtain page loads per visit, bytes transferred per visit and other Web site statistics from a good site analysis tool. Use these criteria to refine your scaling model.
6. Calculate the size of network you need by choosing your maximum acceptable server response time, plus a safety factor.
7. Use data from NSTL Inc. (*www.nstl.com*) or another independent testing facility to determine how many servers and processors it will take to meet your network performance targets. – *Mathew Schwartz*

inventory, relying mostly upon the fulfillment capabilities of partners. To be sure, more than 1,000 of its suppliers — 80% of the business — drop-ship directly to customers. But there are smaller vendors that don't, and that creates scalability concerns. "Frankly, we've had to put computers in their offices so they can receive their orders by e-mail," says Wilcox. BuyItNow.com must weigh dropping those vendors altogether vs. the value of the relationship.

Both KBkids.com and SmarterKids.com chose large distributors whose seasonal selling patterns complement their own busy time before Christmas. SmarterKids.com uses J. L. Hammett Co., an educational supplier that does a lot of business in early autumn and is located nearby in Braintree, Mass. Secor says the integration between systems wasn't difficult. SmarterKids.com wrote the processes that directly interface into J. L. Hammett's AS/400 distribution systems. Because of that high level of integration, customers now automatically get real-time inventory views, order confirmation and shipping details and confirmation, with the Web address to a product tracking number included.

Under the Tree

It's four weeks before Christmas, and already one of the companies has seen its worst fear realized. Despite all the planning and monitoring, one little detail brought down the KBkids.com site during the ultralucrative weekend after Thanksgiving. The problem stemmed from its Internet service provider's inability to handle two different KBkids.com rebate offers simultaneously [News, Dec. 6].

In early December, another frustrating problem occurred at BuyItNow.com's headquarters. To avoid using resources needed to support customers while they surf the site and buy products, the company has an independent pipe for updating the site, handling its call center Web-based order entry system and batching orders out to vendors. On a weekday afternoon, that network pipe, which is serviced through ioNet Inc., Oklahoma's largest Internet service provider, went down, which meant the company had to rely on slower backups. It wasn't until the next day that the problem — a faulty router — was discovered and fixed.

If Christmas 1999 really is the season of reckoning for e-commerce, it won't be hard to tell the winners from the losers. The retail industry has long-established metrics for measuring success.

All three companies would like to have an initial public offering (IPO), and soon. After having an IPO for BuyItNow.com, Wilcox says, he hopes to have them for the 14 individual stores. "Why have one IPO when you can have 10?" she says. "We have visions of grandeur." ◗

> Why have one IPO when you can have 10? We have visions of grandeur.
>
> RANDY JO WILCOX, PRESIDENT AND CHIEF OPERATING OFFICER, BUYITNOW.COM LLC

IT PAYS TO BE PREPARED

Editor Cynthia Morgan finds that at SmarterKids.com, redundant redundancies mean a good night's sleep.

DEC. 3

No pillow talk last night for CIO Richard Secor and his SmarterKids.com Internet engineers. They sleep with Motorola i1000 radio/mobile phones by their pillows. Despite record traffic, however, the phone's been quiet.

CW ON-SITE

In a world where paranoia is part of the job description, Secor would still be described as cautious. His site architect, Internet engineer Kevin Grady, runs notoriously fickle Windows NT, Internet Information Server and Microsoft's industrial-strength version of Commerce Server, yet he doesn't believe in the word *reset*. There are so many redundant servers, backup plans and what-if contingency systems in place that I start wondering about overkill.

It's apparently paying off; analyst firm Newport Group in Barnstable, Mass., calls SmarterKids.com one of the most prepared online retailers around. While many commerce site engineers spend their holiday nights sweating crises, Secor's team actually gets some shut-eye.

4 A.M. Like many dot-com CIOs, Secor's up and making his first site checks via a 56K bit/sec. modem. "If something goes wrong," he says, "we want to have time to find out and correct it" before site traffic starts its steep noonday climb. The night's been trouble-free, so Secor spends the next couple of hours answering e-mail.

9 A.M. Topic for Secor's morning staff meeting: Staples.com. Somebody broke into Staples Inc.'s Web servers and posted ads for the competition. Now that the idea's planted in the brains of several thousand mischief-makers, Secor wants to slam the door on that particular party trick.

10:15 A.M. CEO David Blohm gets a status report from his operations vice president, Mark DeChambeau. So far the company's distribution partner, J. L. Hammett Co., is keeping up with rocketing sales, but things might get tight. Blohm tells Albert Noyes, senior vice president for sales and marketing, to assemble a crew to help pack and ship. "Tell them," he adds quietly, "it's not an option."

10:50 A.M. I meet Noyes and borrow his computer to order Christmas gifts from the SmarterKids.com Web site. It offers free shipping but then tries to charge me for it. "Wait a minute," orders Noyes, who calls the site builders. "The checkout screen's not defaulting to free shipping," he complains, and is assured it will be fixed. I fumble for my sister's ZIP code, and he calls again. "We need to add a ZIP code locator to the checkout screen," he orders. "For now, just add a link to the post office service."

12:30 P.M. Secor's lunch arrives. It takes a lot of food – sandwiches, salads, brownies – to keep this CIO going. Secor labels each item in the order in which he'll eat it – Lunch No. 1, 2, 3, 4 – and promises me he'll be ready for Lunch No. 5 by close of business. He's jubilant; the team has just about nailed a spontaneous-reset problem with some of the commerce servers.

The ever-present phone beeps. Down at co-locator Exodus Communications, Grady has found a problem. "I'm going to have a little talk with the WebLine people," he radios in, "I've just finished with the server and it's wide open." Grady's just discovered that the Cisco Systems Inc. WebLine chat server, which will let customers reach customer service while online, might permit outsiders access to server files. "Shut it down and come on in," Secor decides.

2 P.M. Grady arrives, and the two head off for a meeting with the Oracle Corp. sales rep. I ask Grady what has become my signature question: What's your worst nightmare? "I don't have nightmares," he promptly responds. "That's Rick's job." He eyes the still-laden table. "Are those good?" Secor sighs and hands him Lunch No. 3.

3:05 P.M. Shifts are changing at J. L. Hammett's warehouse, which has become a sort of home away from home for DeChambeau. I tell him I placed an order this morning. "It'll be on the floor by about 7 p.m. tonight," he promises.

5 P.M. The relationship with Hammett is a unique one; it's far closer than most third-party fulfillment arrangements I've seen with electronic retailers. Rich Holder, Hammett's president, says the SmarterKids partnership has worked out well. "They've taught us a lot about how to think like an Internet company. And we've taught them a lot about dealing with your suppliers and building a stable distribution system."

5:15 P.M. Paper order forms shoot from a massive IBM AS/400 setup crammed into Hammett's tiny information technology department. They've filled two carts with 18-inch stacks so far; the evening shift will work till midnight to get those orders on the truck. My order is one of them.

9:15 P.M. Back at home, I test the site again by placing another Christmas gift order for SmarterKids merchandise. This time, the order screen defaults to the correct shipping price. I don't see a ZIP code locator, but I suspect I will soon.

– Cynthia Morgan

SMARTERKIDS.COM ORDERS are sent to the warehouses of partner J. L. Hammett. The orders are printed and stacked for retrieval, packing and shipping by the Hammett crew. During the holiday season, however, order volume rises until even SmarterKids.com employees get into the act

Technology Happenings

■ **@Home Corp.** agrees to buy **Excite Inc.** for $7.5 billion in stock.

■ **Electronic Data Systems Corp.** and **MCI WorldCom Inc.** announce an agreement to exchange assets and 13,000 employees in a series of transfers valued at about $17 billion.

■ The **Federal Communications Commission** approves the $32 billion merger of **AT&T Corp.** and **Tele-Communications Inc.**

■ **3Com Co.** unveils the **Palm V** and the **Palm IIIx**.

■ **EToys Inc.** nearly quadruples in value after its initial public offering (IPO), reaching a market valuation of $7.7 billion. Shares of **Akamai Technologies Inc.** rise to more than five times the IPO price; the firm reaches a valuation of $13 billion.

■ **Microsoft Corp.** says it will alter a feature of its **Windows 98** operating system that sends hardware identification numbers back to Microsoft during a registration procedure.

■ **Amazon.com Inc.** enters the online auction market to compete with existing vendors like **eBay Inc.** and **Onsale Inc.**

■ The **Melissa** virus affects PCs that have Microsoft Word software and mail programs **Outlook** or **Outlook Express**. It causes PCs to send 50 copies of a message containing a list of pornographic Web sites.

■ **Computer Associates International Inc.** acquires **Platinum Technology International Inc.** for $3.5 billion.

■ **Yahoo Inc.** buys **Broadcast.com Inc.** for $5.7 billion.

■ **GTE Corp.** acquires half of **Ameritech Corp.**'s cellular telephone assets for $3.27 billion.

■ U.S. District Court **Judge Thomas Penfield Jackson** declares **Microsoft** a monopoly in his findings of fact.

Other Notables:

■ *Star Wars, Episode I: The Phantom Menace*, the first *Star Wars* movie in 16 years, is released.

■ On the 30th anniversary of the original festival, **Woodstock '99** ends in fire, riots and chaos.

■ The first **nonstop global balloon flight** is completed in 20 days.

The Best in IT

BY MARY BRANDEL

THROUGHOUT the year, Flashback has taken a look at the most important events in 50 years of computing. Now that we've reached the last year of the millennium, it's impossible to say what the next generation will see as the biggest events of 1999. Instead of venturing a guess, we asked some of the participants in the past 50 years in computing what they think.

Robert Metcalfe, who defined the general principles of Ethernet and founded 3Com Corp. in Santa Clara, Calif.:

"The FCC, especially Chairman Bill Kennard, stood up to the telephone local exchange carrier monopolies — members of the U.S. Telephone Association. He wouldn't let them tie AT&T's hands in deploying cable modems to compete with them.

"He ruled that the telopolies have to offer 'line sharing,' so that Internet access providers can work around the old local telephone monopolies to accelerate the deployment of digital subscriber lines, thereby accelerating the deployment of high-speed, always-on residential Internet access.

"As the deployment proceeds over the next 10 years, reaching most of America's 100 million homes, the industry will have to do quite a lot different. New kinds of computers will emerge, like Dell's new Web computer.

"New operating systems will also arrive — not personal ones like Windows 2000, but network operating systems. We will also see new applications that exploit high-speed and/or always-on capabilities."

Gordon Bell, inventor of Digital Equipment Corp.'s VAX machine and currently senior researcher at Microsoft Corp.:

"The most important event of 1999 was the massive and continued infusion of venture capital [into Silicon Valley]. This is enabling the formation of 10 new dot-com e-companies and Internet technology infrastructure companies of all types per day to exploit the Internet and World Wide Web."

Tim Bajarin, an industry analyst since 1981 and now president of Creative Strategies Inc. in Campbell, Calif.:

"The No. 1 thing 1999 will be known for is the year that Internet appliances began to become a part of the computer world's lexicon.

> The most important event was the massive and continued infusion of venture capital.
>
> GORDON BELL, INVENTOR OF DIGITAL'S VAX

"It's not so much the dawn of the post-PC era — because PCs are not going away. We are really entering the PC-plus era.

"Over the next three to five years we will see Internet appliances become mainstream products."

1999

Walid Mougayar, the author of *Opening Digital Markets* and a consultant and lecturer on the impact of electronic markets on business:

"1999 will be known as the year that business-to-business applications on the World Wide Web showed real signs of staying power. Its largest segment — electronic procurement — allowed companies such as Ariba, Commerce One, PurchasePro, Chemdex, PartMiner and Healtheon to shine.

"Most of these companies approach their solutions as 'hosted applications' on the Web. The long-term impact is that hosted applications or 'rent-an-app' will relieve IT departments from the burden of applications development."

Tom Van Vleck, a junior member of the team that created the Compatible Time-Sharing System, the first demonstration of computer time-sharing, in 1961:

"1999 will be remembered as the year when the Internet finally happened for nonenthusiasts. Having an [e-mail] address became unremarkable, URLs appeared on TV ads, billboards and print advertising, and many folks bought things online. A second gold rush developed around electronic commerce, and millions were paid for domain names."

Barry L. Bayus, professor of marketing, Kenan-Flagler Business School, University of North Carolina at Chapel Hill:

> The FCC stood up to the telephone local exchange carrier monopolies.
>
> ROBERT METCALFE, FOUNDER OF 3COM

"The most profound event in 1999 was the official recognition by the U.S. Patent Office that business models [and software] can be protected via a patent. The two key decisions surround the Priceline.com and Amazon.com patents.

"The implication for the future is that companies are now actively trying to own a piece of the general Internet real estate. Historical analogies with the radio industry [and the war among competitors over rights and ownership of the airwaves] suggest that a lot of energy and money will be poured into fierce patent battles in the courts over interpretation of the patents, ownership rights and ultimate control. In the radio industry, domestic and international governments had to eventually mediate and set the rules."

Brandel is a frequent contributor to Computerworld. *Contact her at marybrandel@norfolk-county.com.*

King Hussein of Jordan dies at age 63.

NATO launches air strikes on Serbia to end attacks against ethnic Albanians in Kosovo.

More than 15,000 people die in an earthquake in Turkey that measures 7.4 on the Richter scale.

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

The Senate acquits President Clinton of impeachment charges.

Two Colorado students go on shooting spree at Columbine High School, killing 15, including themselves.

EgyptAir flight 990 crashes into the Atlantic, killing all 217 on board.

■ Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

The Electronic Apple

New York is embracing e-commerce with a passion. Start-ups are taking over Manhattan, and IT professionals stand to reap huge rewards By Christine Willard

NEW YORK, NEW YORK. It's the mecca for business, the magnet for creativity. Anywhere else is just a place.

That isn't just based on New Yorkers' fabled ethnocentrism — current hiring projections indicate this vortex will continue to swirl. The city has even outpaced California's Silicon Valley in Internet-related initial public offerings (IPO).

New-media and financial companies are especially hot for information technology professionals. The move to e-commerce and online trading requires more developers and systems talent, says Cliff Kahan, a director at the New York office of recruiting firm Pencom Systems Inc. Major banks and brokerages are offering help services for online activity.

In the new-media markets, a variety of segments are appearing, including content-driven Web sites, large firms with digital presences and small start-ups with unique business models. All of this translates to opportunities, especially for those who thrive in an intense work culture. "Make sure your skills allow for mobility" if you want to work in this market, Kahan advises.

Mayor Rudolph Guiliani's administration supports these new ventures with programs that have already pumped millions of dollars into attracting and supporting high-tech businesses. For example, Digital NYC: Wired to the World is a city-sponsored program that provides matching funds for marketing opportunities — jobs and start-ups — in high-tech districts.

Stiff Competition

Robin Wynn, assistant vice president for technology and staffing manager at The Chase Manhattan Corp., basks in the new competitive marketplace.

"That's what makes New York a good place to work," Wynn says. Competition for IT professionals keeps salaries and benefits great — but competition among candidates for desirable jobs brings her strong applicants.

Looking for skills to fuel e-commerce and Internet solutions, Wynn is facing stiff competition for professionals with Java, Visual Basic, Sybase, Oracle, Unix and C++ skills; programmer/analysts who have experience in the full project life cycle; and developers and systems administrators.

Chase Manhattan is willing to be flexible about work hours and allowing employees to work from home, but the banker's buttoned-down image won't change in the near future. That's the niche the Federal Reserve Bank recruits against in the New York market.

"It's a lifestyle decision," says Kendra Brandrup, an IT recruiter at the Federal Reserve. With senior public-sector jobs paying 10% to 20% less than the private sector, she is able to offer prospective employees up-to-date systems and projects in the latest areas of systems development and electronic security in a relaxed environment.

Start-ups are causing a brain drain from larger corporations in the metropolitan area, says Kathleen Harris, a division director at Houston-based RHI Consulting Inc., a division of Robert Half International Inc. Companies such as Register.com, the largest independent domain registrar on the Internet, attract high-energy talent with the excitement of creating a new business and the dream of cashing in big on stock options after an anticipated IPO.

"It's like a different company every two months," says Shonna Keogan, director of corporate communications at Register.com. "It's creative and entrepreneurial. Everybody who works here just loves it."

That's the kind of cachet that fuels the competition to be cool enough to attract bright IT professionals to jobs in New York. And media companies have it. Oxygen Media Inc. in New York, an interactive women's Internet site, with a cable television channel starting in February, is "spoiled for choice," Keogan says. It's the brainchild of Oprah Winfrey and Geraldine Leybourne, Nickelodeon Network Inc.'s genius, among others.

Long hours. Intense work. Crowded conditions. What more could a New Yorker want? Well, they're just part of the offerings at new companies quickly outgrowing their physical surroundings and staff capabilities. "It's starting to look like a cramped newsroom in here," Keogan says wryly.

Willard is a freelance writer in Los Osos, Calif.

Top Skills and Salaries in The Apple

Salaries:

JOB TITLE	NEW YORK	NAT. AVERAGE
CIO	$291,000	$140,000
Director of IT	$180,000	$95,000
Director of systems development	$122,000	$98,000
Director of networks	$110,000	$84,000
Director of IT operations	$92,000	$87,000
Network administrator	$62,000	$53,000
LAN manager	$64,000	$57,000
Project manager	$106,000	$76,000
Project leader	$69,000	$66,000
Senior programmer/analyst	$82,000	$59,000
Programmer/analyst	$62,000	$49,000
Database manager	$81,000	$68,000
Webmaster/Web designer	$56,000	$53,000
Computer operations manager	$75,000	$66,000
Computer operator	$37,000	$32,000
Technical support manager	$71,000	$49,000
PC technical support specialist	$53,000	$38,000

SOURCE: *COMPUTERWORLD*'S 1999 ANNUAL SALARY SURVEY, PUBLISHED IN SEPTEMBER

Top Skills:

SKILL AREA	BIGGEST DEMAND
Internet	HTML, Java
Languages	C++, Cobol
Development tools	MS Visual Basic, Visual C++
Networking tools	TCP/IP, IPX
Databases and relational databases	Microsoft SQL Server, Oracle, DB2
Operating systems	Windows 95, Windows NT
LAN skills	Microsoft NT Server, Novell NetWare
Systems software and support	Year 2000 conversion, help desk support

SOURCE: *COMPUTERWORLD*'S ANNUAL SKILLS SURVEY, PUBLISHED IN NOVEMBER

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Database Administrator sought by Computer Services Co. in Edison, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp coding, testing & implmtg d/base in UNIX & Windows envrmts using ORACLE, VB w/ODBC & maintaining Internet/ Intranet sites using HTML and JAVA. Respond to: HR Dept, Ram Compu Creations, Inc, 295 McKinely Ave, Edison, NJ 08820.

System Administrator sought by Bank in NY, New York. Must have Masters in Comp Sci, & 5 yrs exp in Unix operating systems, HP-UX, Solaris & Digital UNIX & admin of TCP/IP networks, NFS, NIS/ DNS services & performance tuning. Respond to: Lisa Ente, HR Dept, Credit Lyonnais NY Branch, 1301 Ave of the Americas, New York, NY 10019. Please refer to job code CL002.

Experienced IT Professionals wanted:

Software Engineers, Programmer/Analysts, DBA's, Unix Administrators with one or more of these skills, UNIX, Oracle, Sybase, MS SQL Server, VisualBasic, VC++, PowerBuilder, JAVA, HTML, ASP, Object Oriented Design experience with CORBA etc.

Send resumes to: Multiphase Technology Corporation, Attn: Recruiter, 312 Quaker Church Road, Suite A2, Randolph, NJ-07869

Unicom, Inc. is a professional software consulting firm providing services throughout the United States. We are seeking to fill multiple full-time positions for Software Engineers to design develop, plan and test computer programs. Software Engineer positions require a of a Bachelor of Science in Comp. Sci., eng. rel. field or equiv., and 1-5 years of experience (depending on position) in one or more of the following skills:

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Please mail resume to: Human Resources, Unicom, Inc., 2 Lucy French Way, Ashland, MA 01721, or fax to: (508) 881-2410.

Corporate Computer Services, Inc., a MA IT Co., is looking to fill up the following positions at their work sites in Woburn, MA.

Programmer Analyst- Bach in engg, math, sci & 2 yrs exp in job (or) 5 yrs exp in job.

Software Engineers: Must have exp. in using UNIX, C/C++. Masters in Elect/Comm., Eng,Comp.Sci, with 2 yrs exp. (or) Bach w/5 yrs exp/ dsgn and dvlp, various s/ware applics using UNIX, C, C++, Sybase & CASE tools.

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Send resumes to HRD, Corporate Computer Services, 400 W. Cummings Park, Ste 5400, Woburn, MA 01801.

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- Java, Java Script, HTML, Oracle
- Developer 2000, RDBMS, Corba
- Y2K Comp., Forms 4.0, Reports 2.5
- Crystal Reports, DBA, ASPS, Visual Basic, Web Design developer
- ABRAXAS
- DHTML, JDK Swing
- Visual J++, Jbuilder, Visual Cafe
- SAP R/3

The applicant should also have exp. in: interface w/hardware & software, provide functional cust. implement, config, train, analyze, interpret, code, test, backup, install, manage, customize, tuning, perform AS-IS study, of software. Dev Internet/Intranet appl., stored procedures, triggers. Create: database tools, tables, files, roles, indexes, space mgt, re-organize & sec. Asp, Web pages.

Apply w/resume to
Attn: Recruiter
35-B Bridge Street
Metuchen, NJ 08843

Systems Engineer sought by New Jersey based IS/IT Professional Consulting Services Firm for job locs throughout US. Must have Bach in Electrical Engg & 2 yrs in s/ware exp. Respond to: HR Dept, MJ Technology of NJ Inc. 762 Green St, Iselin, NJ 07724.

Engineers, Telecom ASIC Design (multiple openings) sought by Hi-tech Telecom Dvlpr in Princeton, NJ. Must have Bach in EE, Electronics, Comp Engg or Comp Sci & 2 yrs exp dsgng & dvlpg systems h/ware & ASIC for hi-tech, large bandwidth telecom networks. Please respond to: Attn: Kondo/CCRL, NEC USA Inc., 4 Independence Way, Princeton, NJ 08540.

Romac International has a need for an experienced Sr. Systems Engineer to research and develop state of the art applications with the following skill: Informix Online, Informix 4GL, Informix ESQL/C, Impromptu, Oracle Financials, Powerbuilder, Information Engineering Workbench, WinNT, Pro*C, PDP-11, Unix Natural 2, and SQL Report Writer. M.S. Comp. Sc. Or Comp. Engg., with min. 2 yrs. Exp. Reply to jpaske@romac.com or fax to 770-351-4919.

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SOFTWARE ENGINEER to analyze, design, develop, test and implement client/server applications using state of the art tools such as PowerBuilder, Qracle/ Sybase, C/C++ on IBM AS/400 using QS/400, AS400CL, CQBQL400, RPG/ 400 and related languages with case tool Synon; customize business and financial applications to specific needs requiring database administration, enhancement and database customization; design and develop software products targeted toward financial applications using Oracle database; and prepare detailed documentation for the end-user. Require: B.B.A. in Computer Science/Information Systems and two years experience in the job offered or any experience providing skills in described duties. Salary: $58,000 per year, 8:30 am to 5 pm, M-F. Apply with resume to: Secretary/Treasurer, UNISA America, Inc., 10814 NW 33rd Street, Suite 100, Miami, FL 33172.

Programmer sought by New Jersey based IS/IT Professional Consulting Services Firm for various job locs throughout the US. Must have Bach in Comp Sci or Comp Engg & 1 yr exp in comp s/ware dvlpg/consulting. Respond to: HR Dept, IVth Generation, Inc., 255 Old Brunswick Rd, Suite 240, Piscataway, NJ 08854

Investment Banking Co. in NJ req. Software/Engg. with the following:

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Programmer Analyst - Heathrow, FL - Analyze reqs, design, develop & implement client/server systems using GUPTA SQL Windows & SYBASE on UNIX based hardware. M-F. 8 AM - 5 PM, 40 hrs/wk, $52,000/yr. Req: Bach in Comp. Sci., Math or Engr. & 2 yrs exp. Submit resume to: Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869, Re: JO FL# 2027127

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Programmer - Analyst: Design, development and implementation of application software using ADW (KEY), IDMS, COBOL and JCL in CICS and MVS batch environments on IBM mainframes. Plan, develop and test programs. Requires: 2 yrs. exp. in job offered or 2 years exp.. as a Programmer or a related position with same duties and B.S. in Enng, Comp. Sci. or a related field. Exp. ref. required. Salary: $82,000/yr. EOE. Send resume to: DelSoft, 106 Bombay Lane, Roswell, GA, 30076.

Software Developer needed for CTI Call Center in Roswell, GA to analyze, design, and develop application systems using SQL, Visual C++, Visual Basic, Access and MFC. Req. B.S. in CS plus at least one yr exp. in job described. $65k/yr. Resume to: Geri Duty, America's Tele-Network Corp., or geri@atnc.com, or fax: 770751-5955.

Software Engineer - Heathrow, FL - Support & maintain info sys using GUPTA SQL Windows. M-F, 8 AM - 5 PM, 40 hrs/wk, $48,000/yr. Req: Bach in Comp. Sci., Math or Engr. & 2 yrs exp. Submit resume to: Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869, Re: JO FL# 2027039

SQFTWARE ENGINEER to provide specialized computer consultancy services to analyze, design, develop, test, implement and maintain application software for projects related to financial management, inventory and materials management, systems simulation using client/server and GUI tools such as PowerBuilder, NewEra, database management tools Informix, SQL, Server and SQL Anywhere, ERWin, DQS and UNIX operating systems with programming languages C and Java. Require: M.S. in Engineering/Computer Science and one year experience in th job offered. Salary: $63,000 per year, 8 am to 5 pm, M-F. Apply with resume to: General Manager, Consulting, Martek Holdings, dba Mascon, Inc., 1642 Powers Ferry Road, Bldg. 21, Marietta, GA 30067.

BOSE Corporation, an innovative leader in consumer electronics and acoustics, has an immediate need to fill a range of SAP, EDI, and Sales Systems Support positions in the Boston area.

The following positions all require a Bachelor's degree (or equivalent) in Computer Science, MIS, Business Administration, or similarly relevant field, and 2-6 years relevant experience to include the requirements described below

PROGRAMMER - ANALYST POSITIONS

a. Sap Basis Administrators (with SAP experience, involving both Qracle and HP-UX and protocols, in a production environment.)

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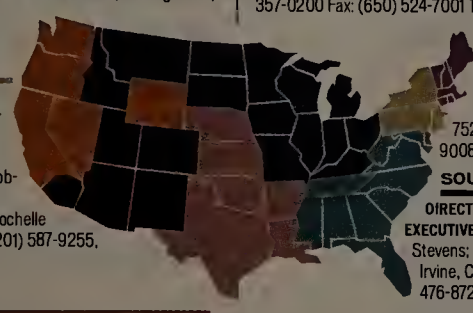

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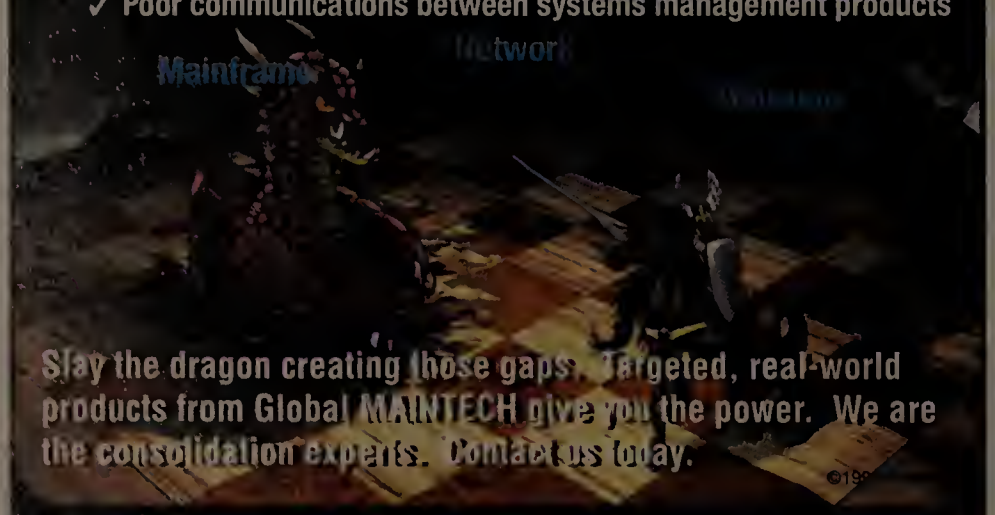

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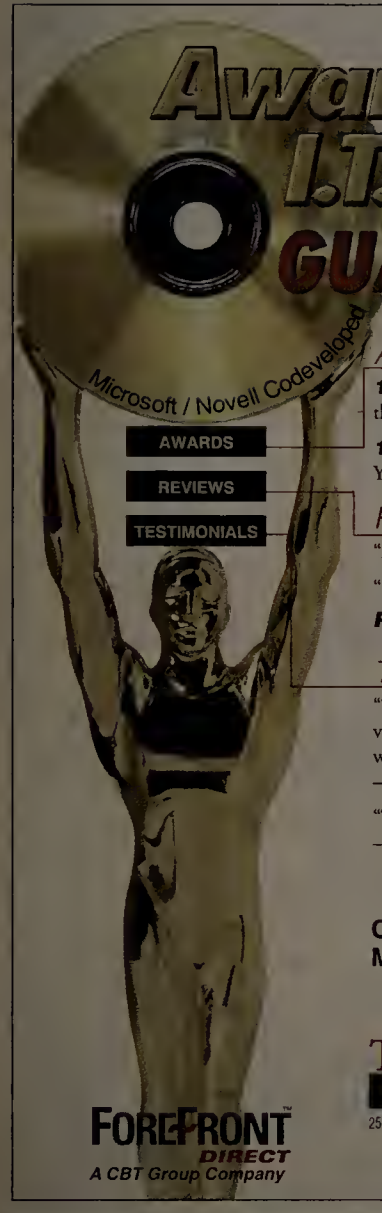

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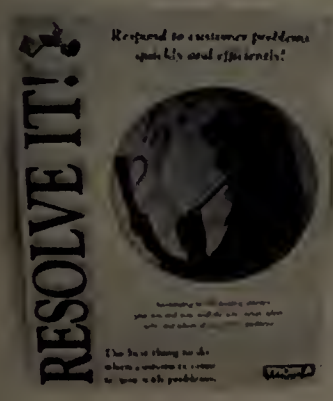

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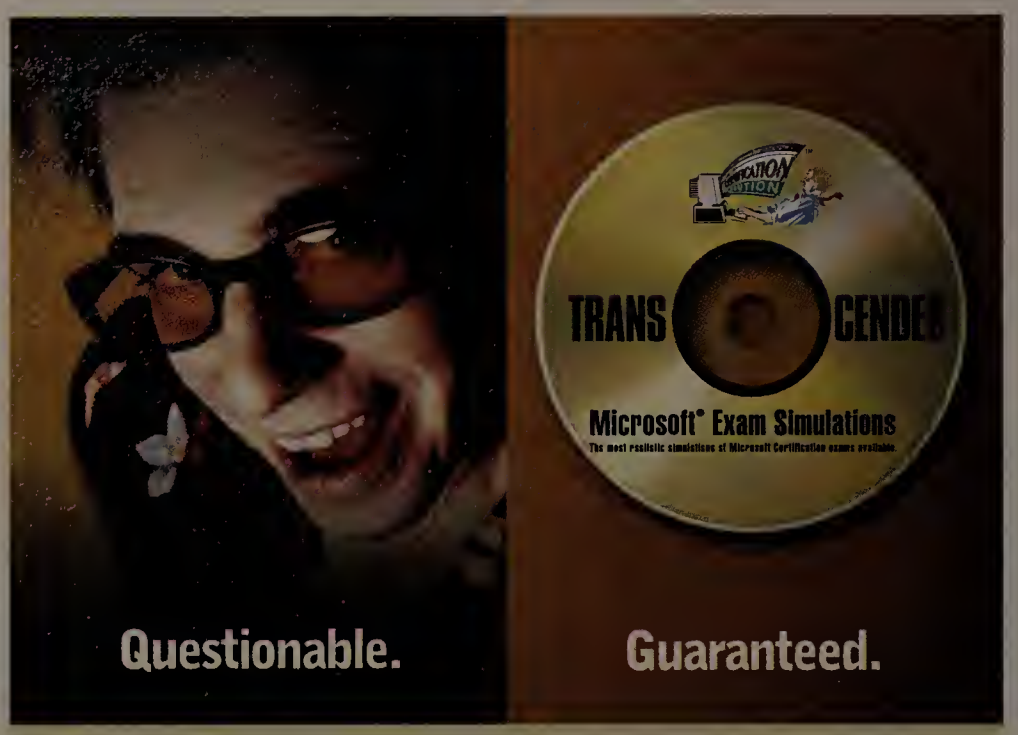

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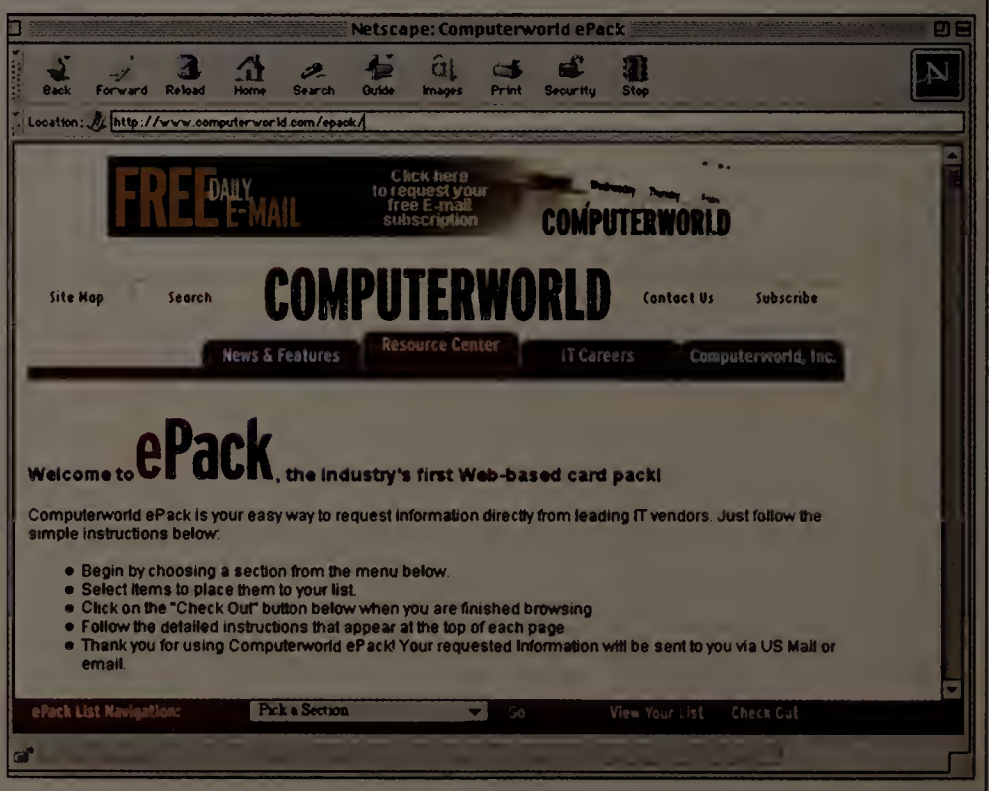


GAINERS

PERCENT	
Be Inc. (H)	92.4
Manugistics Group Inc. (H)	61.2
Security Dynamics (H)	39.4
ECI Telecom	23.4
Microsoft Corp. (H)	23.1
Wink Communications Inc.	22.6
Parametric Technology Corp. (H)	22.1
Bamboo.com	20.8

DOLLAR	
Qualcomm (H)	57.81
Microsoft Corp. (H)	21.44
Ariba Inc. (H)	19.44
Sapient Corp. (H)	18.44
Security Dynamics (H)	18.13
Be Inc. (H)	14.44
Citrix Systems Inc.	14.06
Oracle Corp. (H)	12.00

LOSERS

PERCENT	
Trans. Sys. Arch. (L)	-20.5
Transaction Sys. Architects (L)	-20.5
Silicon Graphics Inc.	-20.0
Network Equipment Tech.	-19.1
Auspex Systems	-18.6
Nextel Communications	-15.1
Fairchild Semiconductor Corp.	-14.4
eToys Inc.	-14.4

DOLLAR	
Juniper Networks Inc.	-37.00
Red Hat Inc.	-27.31
Safegard Scientifics (H)	-16.25
eBay Inc.	-15.63
Nextel Communications	-15.56
Amazon.com	-12.00
Quest Software	-10.13
Trans. Sys. Arch. (L)	-7.00

VA Linux IPO Leads to Craze

BY KATHLEEN OHLSON

VA LINUX SYSTEMS Inc.'s stock debut followed the spiky pattern of other Linux offerings, though even the downward spikes indicate that there's considerable investor interest in Linux.

The company's stock gained 700% in its first day of trading. But its ride — like other Linux initial public offerings (IPO) — came back to reality days later.

The wild run was partly due to the hype surrounding Linux and the relatively small number of shares available to trade, according to Irv DeGraw, senior research director at WorldFinanceNet.com in Sarasota, Fla. Initially 4.5 million shares were available for trading, but the majority of them fell into so-called safe hands — traders who bought VA Linux stock and kept it, DeGraw says. "Only a narrow amount was available to float around, and the bogeymen pushed and pulled it," he says.

VA Linux [Nasdaq:LNUX] in Sunnyvale, Calif., manufactures machines based on processors from Intel Corp. [Nasdaq:INTC] that run the Linux operating system — an alternative to Microsoft's Windows NT. The company's stock opened its first day of trading Dec. 9 at $30 and closed at $320. The price subsequently stabilized at around $180 last week.

Contenders

Other Linux players include the largest distributor of the operating system, Red Hat Inc. [Nasdaq:RHAT] in Raleigh, N.C., and Andover.Net Inc. [Nasdaq:ANDN] in Acton, Mass., which develops Web sites for the Linux and open-source software development communities. Red Hat debuted in August at $54.50 and was at about $250 last week. Andover.Net also launched an IPO Dec. 9, opening at $77.50.

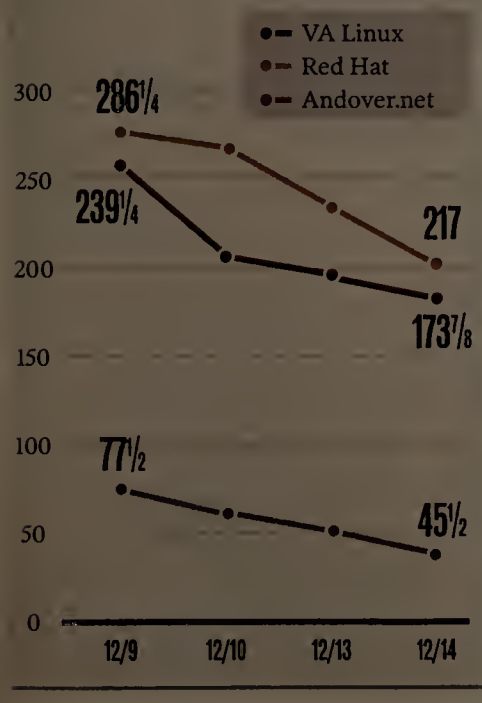
Jeff Hirschkorn, an analyst at New York-based IPO.com Inc., says Red Hat and other Linux-related stocks are all going through a tumultuous trading period now, but the overall market for Linux stocks is strong, he added.

In the long term, however, these companies may get squeezed out by the giant vendors such as Dell Computer Corp. [Nasdaq:DELL] that offer Linux on their own servers, says DeGraw.

INDUSTRY ALMANAC

Linux Fever

Linux IPOs spike high, but have been settling lower recently.



EXCH	52-WEEK	RANGE		DEC. 17 2 PM	WK NET CHANGE	WK PCT CHANGE
SOFTWARE UP 4.5%						
A5WX	101.25	12.50	Active Software (H)	85.75	-0.75	-0.9
ADBE	79.00	18.75	Adobe Systems Inc.	68.75	6.44	10.3
ARBA	253.44	61.00	Ariba Inc. (H)	253.44	19.44	8.3
AZPN	28.62	8.12	Aspen Technology Inc.	27.44	-0.31	-1.1
ADSK	49.43	17.00	Autodesk Inc.	31.13	-1.38	-4.2
AVID	34.25	9.43	Avid Technology	10.13	-0.63	-5.8
BMCS	84.06	30.00	BMC Software Inc.	72.19	3.19	4.6
BOBJ	136.00	16.37	Businesss Objects S.A.	123.00	-1.00	-0.8
CDN	34.06	9.12	Cadence Design Systems	19.38	1.19	6.5
CBTSY	38.25	8.56	CBT Group Plc.	35.13	0.13	0.4
CHKP	223.50	23.00	Checkpt. Software Tech. (H)	197.38	-0.69	-0.3
CTXS	122.00	28.50	Citrix Systems Inc.	120.81	14.06	13.2
COGN	45.25	17.12	Cognos Inc. (H)	40.44	0.31	0.8
CA	69.68	32.12	Computer Associates Intern'l Inc.	60.25	-1.81	-2.9
CPWR	40.00	16.37	Compuware Corp.	35.56	0.75	2.2
DCTM	54.12	9.37	Documentum	44.94	0.19	0.4
EFII	64.87	30.75	Electronics For Imaging	53.31	2.56	5.0
HNCS	99.18	13.75	Hnc Software	90.50	3.00	3.4
HYSL	35.18	9.87	Hyperion Software (H)	30.88	0.75	2.5
IDXC	50.75	12.43	IDX Systems	29.38	-0.69	-2.3
INFA	107.68	19.00	Informatrca Corp.	103.38	-1.63	-1.5
IFMX	14.00	6.03	Informix Software Inc.	11.19	1.75	18.5
INTU	63.00	20.50	Intuit	52.50	-4.50	-7.9
JKHY	56.50	26.43	Jack Henry Associates (H)	54.25	6.81	14.4
JDEC	33.25	10.87	J.D. Edwards & Co.	29.88	2.81	10.4
LGTO	79.50	15.06	Legato Systems Inc.	76.13	3.88	5.4
MACR	88.68	26.37	Macromedia Inc. (H)	82.13	0.63	0.8
MANU	30.13	5.25	Manugistics Group Inc. (H)	30.13	11.44	61.2
MENT	15.06	7.50	Mentor Graphics	12.00	0.13	1.1
MSFT	115.00	64.56	Microsoft Corp. (H)	114.31	21.44	23.1
NETA	67.68	10.06	Network Associates	25.69	-1.44	-5.3
GMH	97.62	33.62	Network General	86.69	-5.56	-6.0
NOVL	31.18	16.06	Novell Inc.	24.19	3.19	15.2
ORCL	91.81	21.00	Oracle Corp. (H)	91.81	12.00	15.0
PMTC	35.56	11.68	Parametric Technology Corp. (H)	35.56	6.44	22.1
PSFT	26.37	11.50	PeopleSoft Inc.	21.88	3.06	16.3
PIXR	50.62	33.00	Pixar	40.25	0.50	1.3
RATL	53.68	21.87	Rational Software Corp.	50.81	3.56	7.5
RHAT	302.62	40.00	Red Hat Inc.	252.69	-27.31	-9.8
QSFT	120.00	20.50	Quest Software	99.25	-10.13	-9.3
SAP	55.00	23.75	SAP AG (H)	51.44	5.44	11.8
SCUR	29.00	2.25	Secure Computing Corp.	11.88	-0.50	-4.0
SE	46.43	17.93	Sterling Commerce Inc.	32.94	-0.94	-2.8
SSW	31.25	18.12	Sterling Software Inc. (H)	30.38	2.38	8.5
SDRC	23.43	8.81	Structural Dynamics Research	10.81	0.31	3.0
SYBS	19.81	5.31	Sybase Inc.	17.50	-0.19	-1.1
SYMC	69.31	12.50	Symantec Corp.	58.88	-1.06	-1.8
SNPS	75.62	37.12	Synopsis	63.50	1.06	1.7
SCTC	19.50	7.81	Systems & Computer Technology	17.63	0.69	4.1
BAANF	17.81	8.87	The Baan Co. N.V.	14.00	0.69	5.2
VNTV	18.25	6.00	The Vantive Corp.	17.83	2.38	15.6
TIBX	169.00	19.75	Tibco Software Inc. (H)	157.88	8.88	6.0
TSAI	51.00	20.25	Trans. Sys. Arch. (L)	27.13	-7.00	-20.5
VRTS	117.75	18.37	Veritas Software Corp.	117.75	10.00	9.3
WIND	45.00	11.25	Wind River Systems Inc.	40.94	-0.81	-1.9
TELECOMMUNICATIONS CARRIERS UP 2.0%						
AT	91.81	54.62	Alltel Corp.	85.88	-3.56	-4.0
ANDW	22.87	11.00	Andrew Corp.	14.88	1.50	11.2
T	64.12	41.50	AT&T	53.69	-3.75	-6.5
BCE	81.00	34.31	BCE Inc. (H)	78.75	2.69	3.5
BEL	69.50	50.62	Bell Atlantic	64.81	1.31	2.1
BLS	51.37	39.75	Bell South	47.50	0.44	0.9
BRW	33.18	13.25	Cincinnati Bell Inc.	30.44	0.50	1.7
CMCSK	52.31	27.37	Comcast	51.31	1.31	2.6
CQ	38.18	15.37	Comsat Corp.	18.31	0.00	0.0
COX	52.00	28.50	Cox Communications Inc. (H)	48.94	0.31	0.6
GSTRF	33.00	12.62	Globalstar Telecom. Ltd.	23.75	1.19	5.3
GTE	78.50	57.00	GTE Corp.	73.75	0.94	1.3
NXTL	117.37	19.93	Nextel Communications	87.25	-15.56	-15.1
SPOT	51.25	26.37	Panamsat	48.50	2.94	6.4
QCOM	447.56	25.00	Qualcomm (H)	447.56	57.81	14.8
SBC	59.93	44.06	SBC Communications	51.44	-2.38	-4.4
FON	75.93	36.87	Sprint Corp.	67.69	-1.00	-1.5
TDS	137.00	40.87	Telephone and Data Systems	120.31	-3.69	-3.0
USW	71.25	51.50	U S West (H)	68.94	2.13	3.2
VIA	56.68	33.06	Viacom (H)	56.50	1.44	2.6
WCII	81.50	28.50	Winstar Communications Inc. (H)	72.50	11.13	18.1
WCOM	96.75	83.06	MCI Worldcom Inc.	79.81	2.56	3.3
SERVICES UP 1.5%						
ACXM	31.25	14.56	Acxiom Corp.	21.00	2.81	15.5
ACS	53.00	31.75	Affiliated Computer Servs	39.00	2.81	7.8
AMSY	40.25	19.75	American Mgt. Systems	32.19	-2.25	-6.5
AUD	52.00	20.87	Automatic Data Processing (L)	50.81	0.83	1.2
BSYS	62.00	41.37	Bisys Group Inc.	55.00	-4.00	-6.8
CATP	32.25	10.62	Cambridge Technology Ptnrs	22.56	-1.69	-7.0
CEN	40.50	16.62	Ceridian	20.25	-0.06	-0.3
CBR	29.56	13.75	Ciber Inc.	28.25	1.25	4.8
COD	33.31	10.75	Comdisco (H)	31.31	4.44	16.5
CHRZ	30.00	9.25	Computer Horizons Corp.	16.63	-1.69	-9.2
CSC	87.12	52.37	Computer Sciences (H)	83.81	8.88	11.8
DST	70.25	50.93	Dst Systems Inc.	66.69	2.69	4.2
EDS	70.00	44.00	Electronic Data Systems	63.25	-3.81	-5.7
FDC	51.50	25.68	First Data Group	46.50	2.31	5.2
FISV	40.75	24.12	Fiserv	39.00	3.63	10.2
IT	25.75	9.56	Gartner Group	14.00	1.00	7.7
KEA	43.62	17.25	Keane	29.50	1.13	4.0
NDC	55.25	21.75	National Data	37.44	4.50	13.7
PAYX	44.87	23.56	Paychex Inc.	40.38	-0.06	-0.2
PER	85.75	15.31	Perot Systems Corp.	20.13	0.06	0.3
REGI	8.37	2.68	Renaissance Worldwide	6.25	-0.50	-7.4
REY	25.31	17.31	Reynolds & Reynolds	21.75	-0.19	0.9
SFE	171.50	24.50	Safegard Scientifics (H)	141.75	16.25	10.3
SAPE	110.00	19.00	Sapient Corp. (H)	110.00	18.44	20.1
SMS	73.50	35.50	Shared Medical Systems	49.13	0.69	1.4
SDS	41.93	16.87	Sungard Data Systems	23.25	0.69	3.0
SYNT	17.00	7.00	Syntel Inc. (H)	16.25	0.31	2.0
TECD	44.68	14.50	Tech Data	21.31	-1.19	-5.3
TENF	41.00	17.00	TenFold Corp.	29.75	-0.13	-0.4
TSS	26.25	14.12	Total System Services Inc	16.00	-0.19	-1.2
TSAI	51.00	20.25	Transaction Sys. Architects (L)	27.13	-7.00	-20.5
NETWORK UP 1.2%						
COMS	52.18	20.00	3Com Corp. (H)	48.81	5.75	13.4
ADCT	70.00	26.62	ADC Telecomm. Inc. (H)	65.13	0.38	0.8
ANTC	60.25	15.62	Antec	45.13	2.50	5.9
BNYN	19.37	6.25	Banyan Systems Inc	17.25	1.38	8.7
CS	27.12	7.18	Cabletron Systems (H)	27.00	3.44	14.6
CNEBF	9.75	3.50	Call-Net Enterprises	3.56	-0.25	-6.6
CSCO	103.00	41.25	Cisco Systems Inc	99.50	1.25	1.3
ECIL	45.00	23.75	ECI Telecom	30.69	5.81	23.4
ENTU	70.62	16.87	Entrust Technologies Inc (H)	83.25	6.31	11.1
HRS	40.62	18.25	Harris Corp.	24.56	1.44	6.2
GMH	97.62	33.62	Hughes Electronics/GM	86.69	-5.56	-6.0
ERICY	88.56	20.50	LM Ericsson	58.69	0.31	0.5
JNPR	375.50	90.12	Juniper Networks Inc.	314.00	-37.00	-10.5
LU	84.18	46.87	Lucent Technologies	78.00	-3.63	-4.4
MADGF	5.00	1.43	Madge Networks	4.38	-0.09	-2.1
NCDI	8.00	3.87	Network Computing Dev	7.06	0.88	14.1
NWK	14.81	7.31	Network Equipment Tech	11.63	-2.75	-19.1
NN	39.87	14.00	Newbridge Networks	23.56	-0.63	-2.6
NOK	179.12	55.56	Nokia Corp.	168.88	2.88	1.7
NT	94.00	22.58	Northern Telecom Ltd. (H)	89.56	2.06	2.4
PAIR	18.56	6.87	Pairgain Technologies Inc.	14.94	0.69	4.8
PCTL	11.00	3.25	Picturetel	4.59	-0.66	-12.5
SFA	66.50	20.37	Scientific Atlanta	54.63	-5.25	-8.8
TLAB	77.25	31.75	Tellabs Inc	64.50	2.44	3.9
USW	71.25	51.50	U S West (H)	68.94	2.13	3.2
VRLK	5.25	1.81	Verilink (H)	4.38	-0.25	-5.4
WSTL	13.00	3.81	Westell Technology Inc. (H)	9.88	-0.63	-8.0
SEMICONDUCTORS CHIPS & EQUIPMENT UP 1.9%						
ADPT	57.75	16.68	Adaptec	49.69	2.50	5.3
AMD	33.00	14.56	Advanced Micro Devices	28.88	0.25	0.9
ALTR	68.56	23.93	Altera	49.19	-0.69	-1.4
ADI	76.88	24.37	Analog Devices	76.88	10.38	15.6
AMAT	115.37	39.37	Applied Materials	112.56	4.13	3.8
ASML	109.62	26.43	ASM Lithography Holding	98.63	2.63	2.7
FCS	34.12	18.50	Fairchild Semiconductor Corp.	27.06	-4.56	-14.4
HRS	40.62	18.25	Harris Corp.	24.56	1.44	6.2
INTC	89.50	50.12	Intel Corp.	81.75	9.75	13.5
KLAC	105.25	37.68	Kla Instruments	97.56	6.56	7.2
LLTC	83.18	37.68	Linear Technology	69.50	-2.50	-3.5
LSI	71.37	15.31	LSI Logic	60.25	0.25	0.4
MXIM	95.87	38.75	Maxim Integrated Products	86.31	-1.06	-1.2
MU	85.00	34.25	Micron Technology	70.75	9.75	16.0
MOT	136.43	36.00	Motorola (L)	130.13	0.50	0.4
NSM	51.87	8.87	National Semiconductor	44.00	-5.06	-10.3
STM	145.00	37.06	SGS-Thomson Microelectronics	140.13	3.13	2.3
SLR	98.00	35.25	Solectron Corp.	84.81	-5.69	-6.3
TER	56.00	18.50	Teradyne	48.31	0.13	0.3
TXN	111.50	39.25	Texas Instruments	101.00	-4.75	-4.5
JDSU	273.62	29.12	Uniphase	252.38	10.25	4.2
VTSS	55.37	19.87	Vitesse Semiconductor Corp	50.94	2.44	5.0
XLNX	97.12	28.12	Xilinx	83.44	0.31	0.4
COMPUTER SYSTEMS UP 3.0%						
AAPL	118.00	32.00	Apple Computer Inc.	100.38	-0.31	-0.3
ASPX	15.25	2.81	Auspex Systems	8.75	-2.00	-18.6
BEOS	39.56	3.28	Be Inc. (H)	30.06	14.44	92.4
CPQ	51.25	18.00	Compaq	25.25	0.31	1.3
DELL	55.00	31.37	Dell Computer Corp.	45.25	3.94	9.5
GTW	84.00	25.37	Gateway 2000 Inc.	71.69	3.44	5.0
HWP	118.43	63.37	Hewlett-Packard Co.	107.69	-1.06	-1.0
HIT	147.50	58.87	Hitachi Ltd.	130.63	-5.38	-4.0
IBM	139.18	80.87	IBM	110.13	0.56	0.5
MUEI	22.62	9.00	Micron	10.38	0.06	0.6
MOT	136.43	36.00	Motorola (L)	130.13	0.50	0.4
NATI	35.43	17.18	National Instruments Corp.	32.69	0.06	0.2
NCR	55.75	26.68	NCR	31.63	-0.81	-2.5
NIPNY	125.00	42.62	NEC	105.88	-4.88	-4.4
PRCM	38.25	3.43	Procom Tech Inc.	27.00	-1.13	-4.0
SGI	20.87	6.87	Silicon Graphics Inc.	9.50	-2.38	-20.0
SNE	198.75	65.50	Sony	198.75	11.75	6.3
SUNW	83.03	19.87	Sun Microsystems	75.19	-5.88	-7.2
TRCD	7.25	1.53	Tricord Systems	5.75	0.81	16.5
UIS	49.68	20.93	Unisys	30.31	-4.00	-11.7
INTERNET UP 1.1%						
AMZN	113.00	41.00	Amazon.com Inc.	94.88	-12.00	-11.2
AOL	96.00	23.56	America Online (H)	86.63	-2.88	-3.2
ATHM	99.00	32.75	@home Corp.	48.50	2.88	6.3
BAMB	27.75	8.93	Bamboo.com	16.31	2.81	20.8
CKFR	98.00	16.56	Checkfree (H)	89.69	9.19	11.4
CYCH	24.00	6.68	Cybercash Inc.	9.88	-0.44	-4.2
EBAY	234.00	55.37	eBay Inc.	147.25	-15.63	-9.6
ETYS	86.00	28.12	eToys Inc.	39.13	-6.56	-14.4
EGRP	72.25	6.56	ETrade Group Inc.	29.81	-4.88	-14.1
LCOS	92.62	25.56	Lycos Inc.	81.81	4.06	4.7
OMKT	49.84	11.18	Open Market Inc.	45.13	0.63	1.4
OTEX	42.50	9.50	Open Text Corp.	18.94	1.44	8.2
PCLN	165.00	50.50	Priceline.com Inc.	56.25	-2.38	-4.1
PRGY	50.62	14.00	Prodigy Communications	20.88	-3.50	-14.4
PSIX	73.75	16.50	PSINet Inc.	62.81	-4.06	-6.1
RSAS	57.00	14.25	Security Dynamics (H)	57.00	16.13	39.4
SPYG	33.75	8.62	Spyglass Inc.	23.63	0.31	-1.3
WINK	59.44	21.75	Wink Communications Inc.	59.44	10.94	22.6
YHOO	357.50	99.75	Yahoo Inc (H)	343.13	-6.00	-1.7
STORAGE & PERIPHERALS UP 3.2%						
ADPT	57.75	16.68	Adaptec Inc.	49.69	2.50	5.3
APCC	27.75	13.12	American Power Conversion	27.63	4.00	16.9
CANNY	37.88	19.25	Canon Inc. (H)	37.88	1.88	5.2
DBD	39.87	19.68	Diebold Inc. (L)	21.50	0.50	2.4
EK	80.37	59.31	Eastman Kodak Co. (L)	81.25	0.19	0.3
EMC	98.50	39.25	EMC (H)	96.06	0.25	0.3
IOM	10.18	2.87	Iomega	3.69	-0.25	6.3
MXTR	21.25	4.25	Maxtor Corp	6.25	0.81	14.9
NTAP	167.75	35.50	Network Appliance Inc (H)	158.00	4.50	3.0
LXK	104.00	42.06	Lexmark International Group Inc.	83.69	7.44	9.8
SEG	44.88	25.12	Seagate Technology (H)	44.88	6.44	18.7
STK	41.62	14.25	Storage Technology	17.50	0.81	4.4
TEK	40.00	17.56	Tektronix (H)	36.81	1.81	4.7
XRX	63.93	19.00	Xerox (L)	21.31	3.44	13.9

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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Medical Errors

pitals to adopt a computer system that would flag errors in prescribing medication. The task force includes 32 of the nation's largest employers, such as General Motors Corp. in Detroit.

"What the [academy] has done is make the problem more visible to hospitals and health insurance plans. The probability of hospitals saying to us, 'We think this is a wonderful idea' has gone up because the cat's out of the bag," Milstein said.

Historically, when large employers have asked for quality improvements, it's been "hard to get hospitals to move," he said.

Tom Smith, administrative director for pharmacy and oncology at Moore Regional Hospital in Pinehurst, N.C., said he hopes drug manufacturers will soon adopt a standard bar code on their drug labels.

"I think with the national initiative, the [Food and Drug Administration] is going to mandate that [all] drugs will have to conform to a universal bar code," Smith said. "Until that happens, [drug manufacturers] won't do it."

Unlike the retail industry, drug manufacturers have several bar-code formats, which have impeded providers' efforts to implement handheld devices that could scan and track which care giver administers a particular drug.

Capturing this information electronically, rather than writing it on paper and later entering it into a clinical information system, would dramatically reduce errors, Smith said.

His hospital already uses error-reducing technology in the form of Robot Rx, a centralized system that automatically dispenses bar-coded medications to drawers designated for each patient.

An interface between Robot Rx and the clinical information system, both from San Francisco-based McKesson HBOC Inc., captures drug-delivery information electronically. In the five years the hospital has used the robot, it hasn't made any drug delivery errors, Smith said.

Michael Cohen, president of the Institute for Safe Medication Practices in Huntingdon Valley, Pa., said the health care industry is just in the beginning stages of using handheld devices and bar-code scanning technology — which could reduce errors in administering medication by as much as 85%.

The national dialogue could boost health care industry spending on IT projects that help reduce medical errors, said Rick Allen, director of IT at Wellstar Health System in Atlanta.

"We knew we had to be there anyway. But with the government talking about those things, it should help funding a bit because [hospital] CEOs see the stuff coming out of Washington and want to be on the front end of it," Allen said. ◗

Quality Control

Technology initiatives to reduce medical errors:

- By June, 172 VA hospitals will use bar-coded labels, attached to patients' wrists and nurses' charts, which get scanned when patients take medication.
- On Dec. 6, the American Hospital Association partnered with the Institute for Safe Medication Practices to share best practices (including technology initiatives) for reducing medical errors.

Continued from page 1

Security

companies are expected to participate, but some are expressing reservations.

"It's kind of a dicey issue, because there is a real lack of trust between industry and the government," said Rick Holmes, director of security and quality assurance at Union Pacific Corp. in Omaha.

For instance, Holmes said, if government research leads to a new encryption algorithm with a key-recovery mechanism, the government may have access to that mechanism, but "do we know whether it does or not?"

Holmes also said there was "a veiled threat through this [meeting] about regulation" if companies don't move to voluntarily improve security.

Publicly, government officials aren't saying that, and after the meeting, Commerce Secretary William Daley issued a statement saying that the federal government "cannot mandate a solution" to the private sector.

But Holmes and others at the meeting said the partnership could play an important role.

"We have a need to act together to protect something that we all use but that none of us control on our own," said Bruce Bonsall, director of information security at Massachusetts Mutual Life Insurance Co., an 8,000-employee firm in Springfield, Mass.

Bonsall said he applauded the effort, adding that government and private industry need a means to disseminate threat information and share best-protection practices. "For the most part, corporate America just sits back, and we wait for alerts to come down," he said.

The government could correlate threat information from various key sectors and point out new problems, said Bill Sentecac, director of security at Wells Fargo & Co. in San Francisco. "The government has a lot of ability [when it comes to] coordinating disjointed facts," he said.

But Sentecac said he worries that information shared with the government could be publicly exposed.

Government officials know they face problems in winning corporate support.

"The reality is that companies are ambivalent about all this stuff," said Commerce Undersecretary William Reinsch in an interview. "Because, on the one hand, they want very much to get caught up on the latest information. They want threat reports; they want to hear what is going on out there; and they are very concerned about their own vulnerabilities."

But at the same time, said Reinsch, companies are very concerned about the publicity. "They don't want to be engaged in activities that involve them in admitting that they're vulnerable, because it hurts confidence and exposes them. It's kind of a fine line," he said.

But that could change if a cyberattack succeeds, he said. ◗

JUST THE FACTS

Security Plan

The U.S. wants to enlist companies in cyberdefense

What's the problem? U.S. officials say they can't protect vital services from cyberattacks without private cooperation.

What's the plan? The government has created a "Partnership for Critical Infrastructure Security" that will team private companies and U.S. officials to discuss ways to share information and practices.

What's the worry? Security managers see benefits but worry that cooperation could lead to regulation or public exposure of private security matters.

Wireless Market Open

Win CE, Palm vie for Net devices lead

BY DOMINIQUE DECKMYN

DESPITE Palm Computing Inc.'s dominance among users of handheld devices, the rapidly changing wireless market is still wide open, analysts and users said.

Just last week, Siemens AG in Munich, Germany, and Casio Computer Co. in Japan announced that they will jointly develop, manufacture and market a Windows CE-based palm-size PC with wireless Internet and phone capabilities. And Swedish firm Ericsson Inc. said earlier this month that it will support Microsoft's forthcoming Mobile Explorer microbrowser.

However, Palm Computing was first to market with its wireless Palm VII and is quickly garnering support from mobile handset vendors. Palm Computing, which has filed for an initial public offering, has just received investments from three key players in the wireless and Internet space: Motorola Inc., Nokia Corp. and America Online Inc. are taking minority stakes worth a combined 4.5% in the company. Motorola also signed a memorandum of understanding with Palm to license the Palm OS for future wireless devices.

"Palm is indisputably way out in front as an organizer, but not as a wireless Internet access [operating system]," said Alan Reiter, an analyst at Wireless Internet & Mobile Computing in Chevy Chase, Md. "The mobile handset manufacturers don't know which [operating system] is going to win, and that's why you'll see a flurry of partnerships in 2000 as they explore their choices."

Tim Scannell, an analyst at Mobile Insights Inc. in Quincy, Mass., said Windows CE could still dominate the wireless market, because it will focus on the applications and data-synchronization needs of information technology departments in large corporations, where Windows is already popular.

When engineers at CHR Solutions Inc. in Lubbock, Texas, visit customers, they carry a Palm, a pager and sometimes a laptop, too. "It would be great if we could do everything with a single [wireless] device," said Cary Holmes, a systems design integrator. He said that although the company uses the Palm as an organizer, he would consider both the Palm VII and the next-generation Windows CE devices for wireless applications. ◗

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FRANK HAYES/FRANKLY SPEAKING

Naughty and nice

"POKEMON," GRUMBLED SANTA. "Pokemon, Pokemon — I'm *sick* of Pokemon. Who knew those little buggers would all need Y2K fixes?" With only days to go, elves were swarming through the workshop, furiously adjusting Pikachus and Jigglypuffs. Santa absently reached for a slice of cold pizza as he stared at the unfinished gift list for the IT industry.

"Coming through, big guy!" shouted an elf steering a cartload of Millennium Barbies and Harry Potter books past him. "Why so glum, boss? Aw, you didn't leave the geeks for last again, did you?"

Santa nodded. "What am I going to give Bill Gates? His kids are no problem — they'll play with the box anything comes in. But what do you get the world's richest guy?"

"How about a hacksaw?" said the elf, parking the cart.

Santa frowned. "You really think he'll do prison time?"

"Nah. But if he doesn't start chopping up Microsoft by himself, the Justice Department'll do it for him," the elf said. "Hey, and you could give Joel Klein a chain saw. Who else is giving you trouble?"

"Linus Torvalds," said Santa. "Nice kid, comes from up this way, gives things away for free."

"So send him a white beard and a red suit," the elf said. "Maybe he'll take the hint and you can retire. And is Steve Jobs on the list? After that made-for-TV movie *Pirates of Silicon Valley*, you could offer Jobs a new gig as Noah Wylie's stunt double on *ER* if he ever gets tired of being Apple's permanent interim CEO."

Santa nodded. "What about Scott McNealy?" he said.

"How about a spare hockey stick to fend off the hordes of angry open-source Java programmers from Blackdown.org?" said the elf. "They did all the work of porting Java to Linux, and McNealy didn't even notice. Oh, and give another hockey stick to the new babe in charge at HP, Carly Fiorina. If she's gonna do battle with McNealy, she'll need it."

" 'Babe' is not politically correct," scolded Santa.

"Neither is Barbie," said the elf. "Besides, she *is* a babe, even if *Fortune* magazine says she's the most powerful woman in American business. And, say, how about those kids at AOL who out-hacked Microsoft in the instant-messaging war? We've got a crateload of Twinkies, Jolt and Snickers bars we can use as stocking stuffers. And for eMachines, the cheap-PC maker that got sued by both Compaq and Apple, we can drop off a copy of the next Bill Gates book, *Business @ the Speed of Litigation*."

"Which reminds me," said Santa. "Amazon.com. And eBay."

"Give Amazon an 1899 Sears, Roebuck catalog — it looks like Jeff Bezos is reinventing his company as the world's biggest mail-order outfit, which is what Sears was around 1900. Hey, maybe that's how he's dodging his Y2K problems," said the elf. "And all eBay needs is a couple of spare kidneys, a few babies to sell and a room full of third-graders to bid millions for 'em."

For Gates: A hacksaw so he can cut up Microsoft before the Feds do.

"I think *you* need a long vacation starting Dec. 26," said Santa.

"Just for fun, you can give the virus writers and spammers each other's e-mail addresses," the elf said. "And give the Y2K kooks a perpetual calendar — they keep slip-sliding their estimates of when the panic and catastrophe will start happening."

"What about the Y2K heroes?" asked Santa. "All the ones who are fixing bugs, quashing rumors, making constructive plans, and getting people together?"

The elf scratched his jaw. "I don't think there's anything we *can* get for them," he said. "There's too many of 'em. But they oughtta have *something*."

"Never mind," Santa said. "They're already giving themselves the perfect gift — a Y2K that's a nonevent." ◗

Hayes, Computerworld's staff columnist, still believes in the sanity clause — even after covering IT for the past 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

SHARKY'S Y2K NEWS SUMMARY (like there's anything else going on now) . . . **India** says it's ready (yeah, right), but **Connecticut** isn't. The **U.S. military** spent $3.6 billion of your money in 18 months, so it had *better* be ready. One county in **Tennessee** is ready, thanks to a guy who hot-wired a generator to a gas-pump motor ("nothing like hillbilly ingenuity!" says the proud pilot fish). **Russia** will probably have neither a ballistic missile nor its aviation boss in the air at midnight. Oh, and in **China**, the stock market will be closed. Did you even know China *had* a stock market? **Ninety-seven percent of you** say you're ready, and **72% of kids** say grown-ups have, like, overreacted, dude. However, **0%** of those kids' rear ends are on the line.

THIS PILOT FISH is retiring. His shop has banned IT vacations for December and January. Fine. But all he wanted was a little Christmas-shopping comp time this week. Even volunteered to earn it with extra Y2K duty, including a graveyard shift. The request got shot down. Payback: Our man, who was planning to give three weeks' notice last Friday as a courtesy, gave the minimum two weeks instead. On Dec. 31, promptly at 5:30 p.m., he clocks out and tells the boss to go pound sand. Envious? Me too.

SO SUE ME "We've got [Y2K] letters up the gazoo – a lot of written assurances." That's Calvin Sihilling, CIO of what used to be Richfoods Holdings, which was bought up by Eden Prairie, Minn.-based SuperValu. "But . . . we look at the vendors. If they've done a good job, they'll probably be all right, letter or no letter. All the letters are is an opportunity for litigation."

ITEM: "A Fijian chief has threatened to use ancient rites to call sharks up to attack tourists celebrating the start of the year 2000." Don't look at me, pal! I'd give my left fin to be in Fiji for the turnover. Spitting out Nikons, flossing with Sans-a-Belts. But I'll spend it in an ice-cold data center, just like you. Good luck to us all. Send your Y2K scoops to **sharky@computerworld.com**. And don't forget the Daily: *computerworld.com/sharky*. One more thing: Merry Christmas to everybody who does the *real* work. You know who you are.

The 5th Wave

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